Natural History Museum Library
000163689
S.3 C.10

BRITISH MUSEUM
NATURAL HISTORY

TUTE SI RECTE VIXERIS

PHILOSOPHICAL TRANSACTIONS:

Giving some

ACCOUNT

OF THE

Present Undertakings, Studies and Labours

OF THE

INGENIOUS,

In many

Considerable Parts of the World.

VOL. XX. For the Year 1698.

LONDON:

Printed for *S. Smith* and *B. Walford*, Printers to the *Royal Society*, at the *Prince's Arms* in St. *Paul's* Church-yard. MDCXCIX.

BRITISH MUSEUM
NATURAL HISTORY

To the Right Honourable

JOHN Lord *SOMMERS*,

Lord High Chancellor of *England*,

Preſident of the ROYAL SOCIETY:

And to the

Council and Fellows

Of the ſaid

ROYAL SOCIETY

OF

LONDON,

FOR THE

Advancement of *Natural Knowledge*.

This Twentieth Volume

OF THE

PHILOSOPHICAL TRANSACTIONS

Is humbly Dedicated

By *Hans Sloane*, S. R. Secr.

THE Honourable the *East-India* Company, having received from Mr. *Samuel Browne*, a Physician who has liv'd Seventeen Years in their Service at *Fort-St. George*, or *Madaras*, in the *East-Indies*, a very considerable Collection of dried *Specimens* or Samples of Plants, Fruits, and Drugs; together with an Account of his Observations of the Uses of them, by the Natives and others of those Parts, both in Physick, Dying, *&c.* have very generously and for the Publick Good, presented them to the Royal Society of *London* for improving Natural Knowledge: Who considering the great Use and Improvement may be made of such Collections, have ordered that the Publick shall have the Benefit of this Present, by receiving the whole Account that came with them, from time to time in these Papers, and by taking care that the things themselves shall be preserved from Corruption in their Repository, where recourse may be had to them by the curious, so soon as they are put into such a Condition, as not to suffer by being handled.

PHILO-

BRITISH MUSEUM
NATURAL HISTORY.

Fig: 8

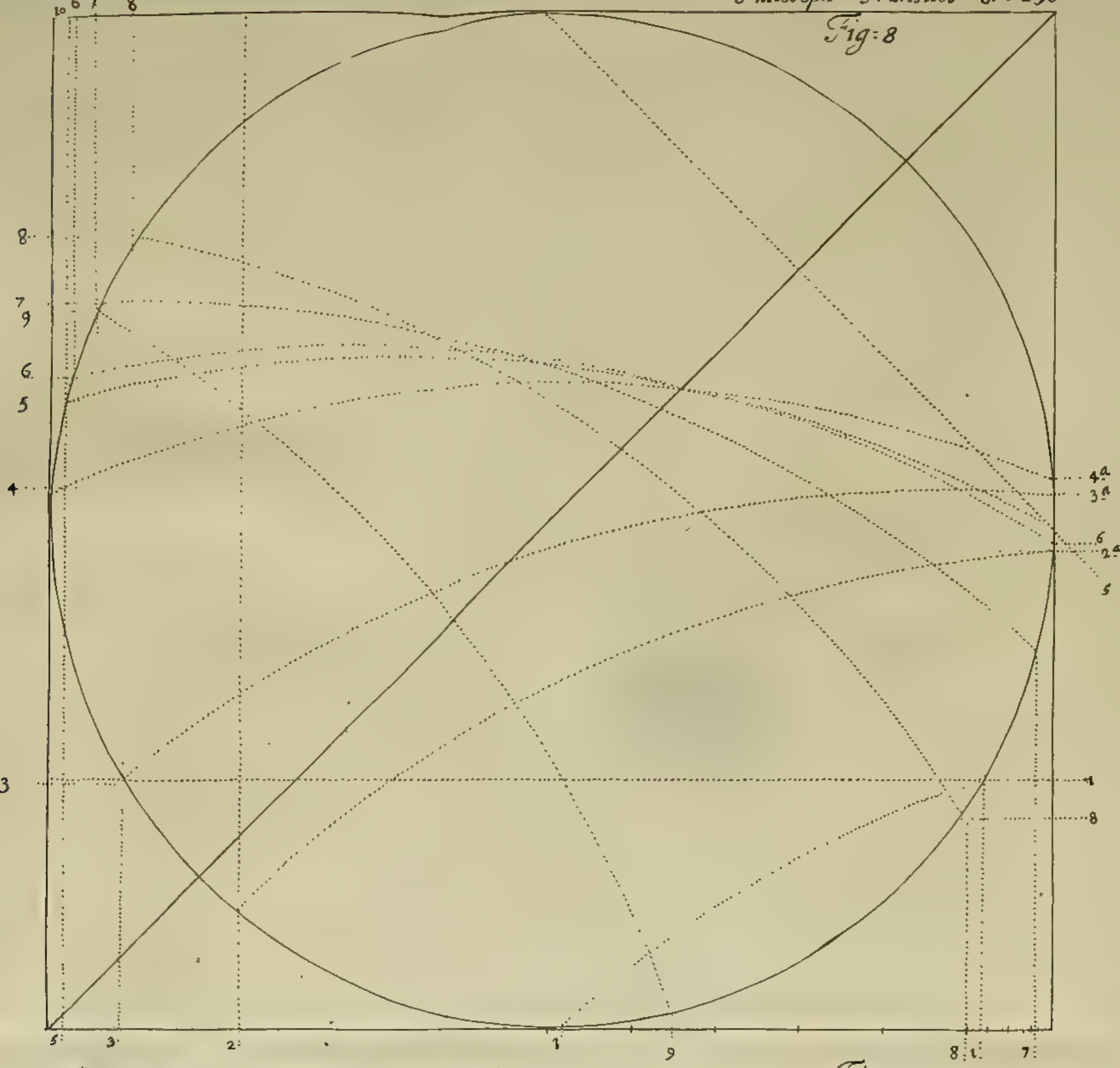


Fig. 1

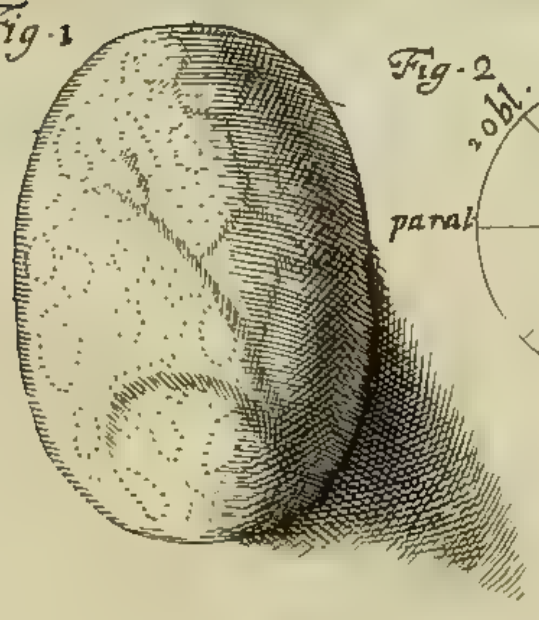


Fig. 2

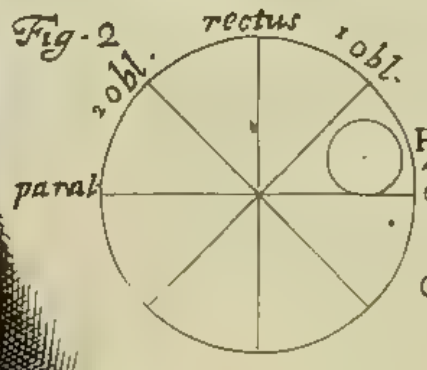


Fig. 3.

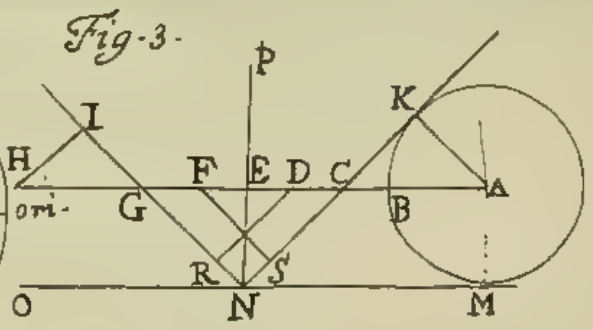
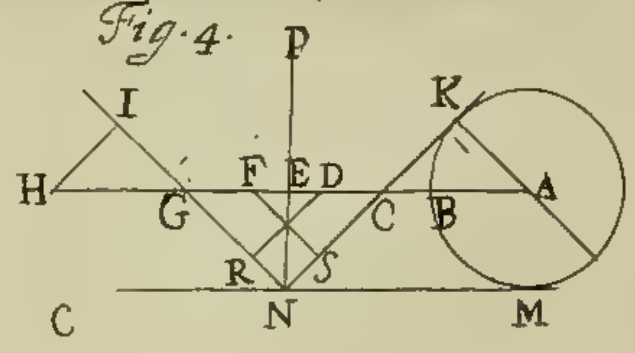


Fig. 4.



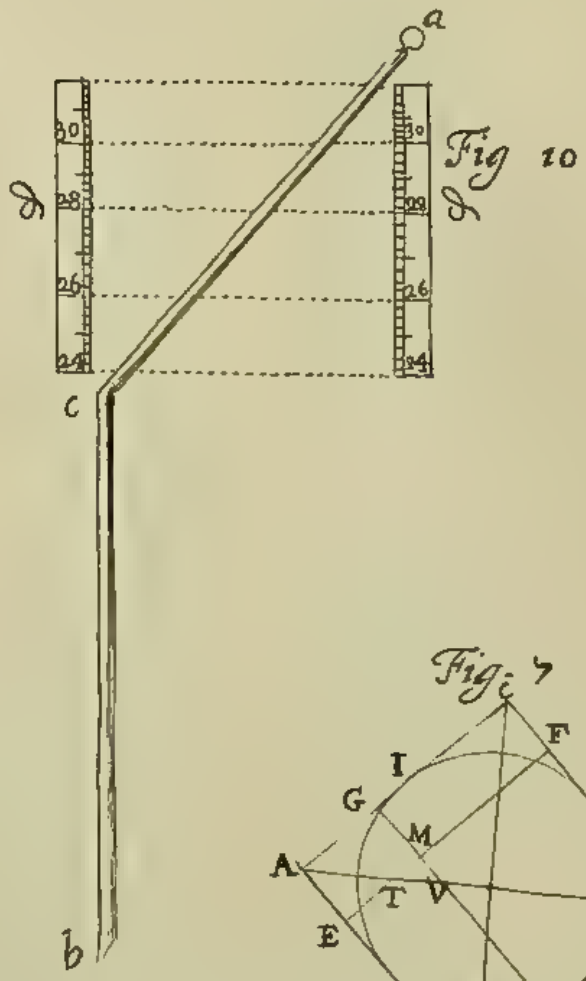


Fig 10

Fig. 5

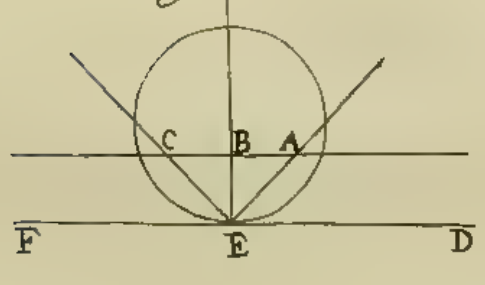


Fig. 6

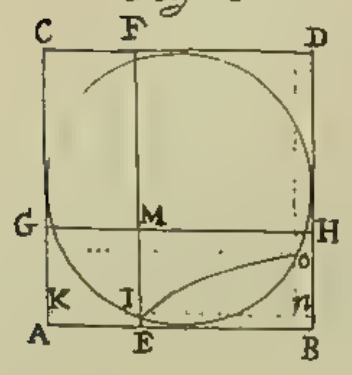


Fig. 9

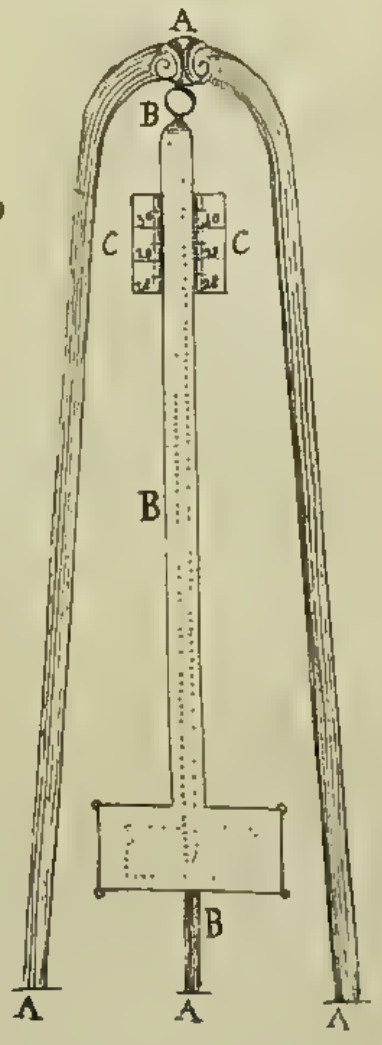
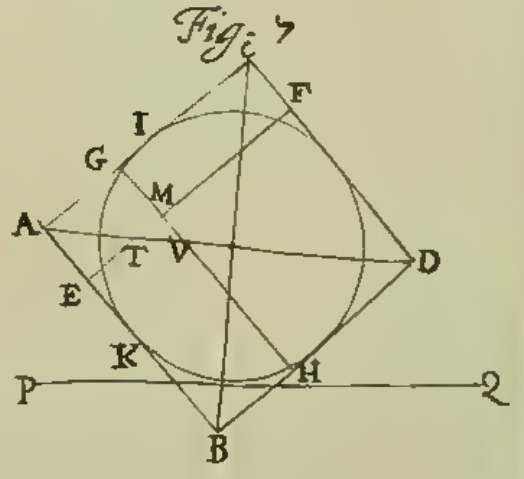


Fig. 7



Numb. 236. Beginning the 20th Volume.

PHILOSOPHICAL TRANSACTIONS.

For the Month of January, 1698.

The CONTENTS.

I. *Part of a Letter of Mr.* Will. Derham, *Rector of* Upminſter, *dated* Dec. 6. 1697. *Giving an Account of ſome Experiments about the Heighth of the* Mercury *in the Barometer, at Top and Bottom of the* Monument: *and about Portable Barometers.* II. *A Letter from Dr.* Wallis *of* Jan. 11. 169⅞. *To Dr.* Sloane, *concerning the Effects of a great Storm of Thunder and Lightning at* Everdon *in* Northamptonſhire, *(wherein divers Perſons were killed) on* July 27. 1691. III. *Some additional Remarks on the Extracting the Stone of the Bladder out of thoſe of the Female Sex. By* Thomas Molyneux, *M. D. S. R. S.* IV. *Eclipſis Lunaris Obſervatio, facta Roterodami die* 29. *Octobris Anni* 1697. *N. S. A Jacobo Caſſini, R. Ac. Pariſienſis Socio.* V. *An Account of a Book, Entituled,* Hortus Medicus Amſtelodamenſis, *ſive Plantarum tam* Orientalis *quam* Occidentalis Indiæ *aliarumque peregrinarum* Deſcriptio & Icones. *Autore* Joanne Commelino *Urbis* Amſtelod. *(dum viverit) Senatore. Et latinitate donatum, Notis & Obſervationibus illuſtratum a* Frederico Ruyſchio, *M. D. Botan. Profeſſ. &c. &* Franciſco Kiggelario, *Amſt.* 1697. *Fol. And to be ſold by* S. Smith, *and* B. Walford, *in St.* Paul's *Church-Yard. With many additional Remarks by* James Petiver, Fellow of the Royal Society.

16

I. *Part of a Letter of Mr.* William Derham, *Rector of* Upminſter, *dated* Dec. 6. 1697. *Giving an Account of ſome Experiments about the Heighth of the* Mercury *in the Barometer, at Top and Bottom of the* Monument : *and about portable Barometers.*

SOME time ſince, I had occaſion to ſatisfy my Curioſity, concerning the Variation of the Mercury on different heights ; and accordingly in *Sept.* 1696. I obſerved it on the *Monument*, by Two of Mr. *Quare's* beſt Portable Barometers. By the beſt of the Two (for both differed) I found the *Mercury* deſcended $\frac{1}{10}$ of an Inch at the heighth of 80 Feet, and $\frac{2}{10}$ at 160 Feet.

But ſince that, finding my Obſervations a little different from Mr. *Halley's* on *Snowden-Hill*, in *Philoſ. Tranſact.* Numb. 229. I thought it neceſſary to renew my Experiments more nicely ; and accordingly laſt *November*, tried again with other portable Barometers ; which err'd intollerably. So that by the by, few of the portable Barometers that I have yet met with, are to be depended upon in ſuch Experiments.

I therefore contrived to carry up the Torricellian Experiment to the Top of the *Monument*, thus : I provided a pretty large Glaſs Tube well cleaned : This I lodged in Wire, and filled with well ſtrained *Mercury* ; which being cleared of all Air, I then plunged the Bottom of the Tube into a broad Ciſtern of *Mercury*, and then fixed both the Tube and Ciſtern together, in the Wire Caſe or Frame. On the Top I left an Eye in the Wire, to ſuſpend the whole Barometer on a String, that it might hang pendulouſly, which is abſolutely neceſſary ; becauſe if the Ciſtern be deeper on one ſide than another, or if the Tube hang more towards one ſide than the other, it will cauſe a great and erroneous Variation in the *Mercury* above, according as the Tube ſtands perpendicularly, or not.

My Inſtrument being thus (I think) very nicely prepared, I marked exactly the Height of the Quickſilver, upon Two Narrow

Narrow Labels of Paper, paſted on each ſide the Tube, both at the Bottom, and in my Aſcent up the *Monument*. The Differences of the *Mercury's* Height I meaſured with a Decimal Inch Scale on thin Braſs. The Quantity of my Aſcent, I meaſured with a Gunter's Chain, becauſe a String would ſtretch.

By the niceſt Obſervation I could make, I found that at the height of 82 Feet the *Mercury* fell $\frac{1}{10}$ of an Inch, and at about 164 Feet $\frac{2}{10}$.

By tarrying above ſomewhat long, I perceived the Preſſure of the Atmoſphere was ſomewhat altered, ſo that the *Mercury* in my Deſcent, was about ,01 of an Inch different from my Obſervations in aſcending. Upon which, I repeated my Experiment by aſcending and deſcending quicker. At both which times, my Obſervations agreed exactly with the firſt Tryal. From whence I conclude that at every 82 Feet height, or thereabouts, the *Mercury* will deſcend ,1 Tenth of an Inch.

I was deſirous to have obſerved at this time, the Proportions of the Deſcent of the *Mercury*, according to Dr. *Wallis*'s Remarks in his Letter to you, *Numb.* 231. but found it in vain on ſo ſmall a height. However, conſidering there is a Difference of 8 Feet between Mr. *Halley*'s Obſervations and mine (which would alter the *Mercury* ,01 of an Inch, which is perceptible) I am inclined to think, that an higher Aſcent than 82 Feet is neceſſary to cauſe the *Mercury* to deſcend $\frac{1}{10}$, the higher we are in the Atmoſphere. But this I leave to your, and ſuch other better Judgments, and Obſervations.

Thus, Sir, I have troubled you with the Method I took, as well as the Obſervations themſelves, that you may the better judge how far what I have done deſerveth Credit, and alſo, that I may give ſome Cautions I found neceſſary to be obſerved in ſuch Experiments as theſe.

To what hath been ſaid, I beg your Patience, while I add a Deſcription of a Portable Barometer, which I conceive may be of great uſe in the former, and many other ſuch Experiments.

Provide a ſtrong Glaſs Tube. Let the Head of it be pinched at about an Inch from the top, ſo as to make a narrow Neck, whoſe Orifice ſhall be as big almoſt as a Straw. This (which is Mr. *Quare*'s way) will much bridle the blow of the *Mercury* againſt

againſt the top, as it danceth up and down, which endangers breaking off the top of the Tube. The bottom of the Tube I would have ground aſlant near half an Inch, that the bottom of the Tube touching the bottom of the Ciſtern, the Orifice thereof may lye about the middle of the *Mercury* in the Ciſtern: which will prevent the Air getting into the Tube, by reaſon the *Mercury* is always about the Mouth of the Tube. The Ciſtern muſt be made wide, either of Glaſs, or cloſe-grained Wood; round the Brim of which, on the out-ſide, muſt be a Notch to tye on the Leather that is to cover it. When the Tube is filled, cleared of Air, and plunged into the Ciſtern near full of *Mercury*, encloſe the *Mercury* with gentle Leather tied very faſt round the Tube near the bottom, which being ſpread over the Ciſtern, tie it round that alſo: The Tube and Ciſtern, thus conjoin'd with Leather, muſt be lodg'd in a Caſe, made very fit to receive both, where they muſt lye very faſt. Thro' the Caſe let three or four Holes be bored, to let the Air in freely to the Leather that covers the Ciſtern, which lying cloſe againſt the Holes, will firmly enough keep the *Mercury* from running out at them.

The whole Inſtrument thus prepared, muſt be ſuſpended on the Top: For which purpoſe a Tripos may be beſt, whoſe Legs open and ſhut by Joynts at the Top.

The Weather-plates are to be put upon the Frame, by ſetting them to the ſame height, at which the *Mercury* ſtands in a common Barometer.

That the whole may be better apprehended, I have annexed the following Figure 9. In which

A. A. A. A. Is the Tripos.

B. B. B. The Frame or Caſe, with the Barometer and Ciſtern in it, repreſented by prickt Lines.

C. C. The Weather-plates.

Fig. 10. Repreſenteth a Tube communicated to me by a Friend, which ſerveth for the more nice meaſuring the height of the *Mercury*: For an Inch of perpendicular height, may be made 2 or 3, by bending the Tube more or leſs. This Tube may be crooked at 28 Inches length, for common uſe; but at 23 or 24 Inches for greater heights, as *Snowdon* (or higher Hills) on which it deſcended to 26,1 Inches in Mr. *Halley*'s Obſervations.

a The head of the Tube, with its narrow Neck, to bridle the Blow of the *Mercury*, as before directed.

b The bottom ground aſlant, as was before directed.

c The Crook.

dd The Weather Plates.

II. *A Letter from Dr.* Wallis *of* Jan. 11. 169⅞. *To Dr.* Sloane, *concerning the Effects of a great Storm of Thunder and Lightning at* Everdon *in* Northamptonſhire, (*wherein divers Perſons were killed*) *on* July 27. 1691.

SIR, *Oxford, Jan.* 11. 169⅞.

IN my Letter of *July* 26. 1697. (which you were pleaſed to inſert in the Philoſophical Tranſactions, Numb. 231. for the Month of *Auguſt*, 1697.) relating to Thunder and Lightning and Hail; I mentioned what had happened, ſome Years ſince at *Everton* or *Everdon*, in *Northamptonſhire*, not far from *Towceſter*, but nearer to *Daventry* or *Daintry*; where divers Perſons were killed, and others hurt, with Lightning. Concerning which, (becauſe it was a remarkable Accident) I have ſince made a more particular Inquiry into the Circumſtances of it; and have an Account thereof to this purpoſe, from Mr. *Richard Butler*, a Gentleman of *Preſton* near the Place, (who is wont to be particularly Inquiſitive upon ſuch occaſional Accidents) and Mr. *Edwards*, Miniſter of *Badby*, adjoining; who were both Spectators or Eye-witneſſes of the Effects thereof, ſoon after it happened.

In Harveſt time, on the 27th Day of *July*, 1691, in *Everdon-Field*, near *Daventry* in *Northamptonſhire*, divers were at work reaping Corn, moſt of them of the Pariſh of *Badby*, *near adjoining*. The Morning was fair and clear, but before Noon there came a violent Storm of Thunder, Lightning, and Rain; which cau-

ſed the dry Reapers to retreat for Shelter, to a Quick-ſet Hedge, with a Ditch by the ſide of it, of about Twenty Yards in Length, croſs the Head of ſome *Had-Lands*, (as they are called) about Twenty Perſons in all; of whom Four (not Five, as was ſaid) were killed, Eight others dangerouſly Hurt, of whom one was a Woman great with Child; (whereof Six were in the Ditch, and Two out of it) the reſt not much hurt.

The Four that were killed, were *Simon Marriot*, a Taylor, and his Son *Robert Marriot* (a Youth of about Seventeen or Eighteen Years of Age,) *Richard Wells* a Shoemaker, and *Thomas Burroughs* a Weaver; all of the Pariſh of *Badby*. Upon the firſt Tidings of it, Mr. *Edwards* the Miniſter of *Badby* repaired to the Place: Where *Robert Marriot* lay on his Back, out of the Ditch, having ſtrugled (as was ſaid by the By-Standers) after the Stroak, Mr. *Edwards* ſays, he ſaw no Marks, or Sign of Hurt on the Body, (though ſome *Londoners* who were there, have ſaid, that all his Bones were broke within him, which is ſuppoſed to be a Miſtake;) but *Deborah Traſeler* of *Badby* (the Woman who laid out him and the reſt) ſays, there was a Hole about the Bigneſs of a Gooſe-ſhot in the Pit of his Stomach, and many more about his Legs. There was in the Hedge a Pollard-Aſh, under which ſat *Simon Marriot* and *Richard Wells*; but *Thomas Burroughs* ſat at the Diſtance of Two or Three Yards from thence. In this Tree were cut or raſed Four (or more) Grooves or Furrows, from the Top to near the Bottom, (deeper than the Bark, and about an Inch broad each of them) on that Side of the Tree on which the Men ſat; but no Damage Appeared on the Tree elſewhere; there being a Knot on the oppoſite Side, which is ſuppoſed to have diverted the Stream of the Fiery Matter. The Green Thorns were Scorched, and the Place ſmelt rank of Sulphur.

Simon

Simon Marriot had the Crown of his Hat cut into the Shape as of a bearded Arrow; and at the Band-place cut ſmooth, almoſt round about from the Brim. His Cloaths on one Shoulder cut jaggedly to the Skin; where was a Scar about Four Inches in Length, of a Long Oval Figure; the tranſverſe Diameter whereof was deepeſt, of a darkiſh red Colour, as hard as Horn all over. He had Snuſh on his Hand, as if juſt ready to take it.

Richard Wells had a little Dog on his Lap, or between his Legs, dead. His Hand upon the Dog's Head, his Eyes open, and with Bread and Cheſe (or one of them) in his Hand, as if going to give the Dog a bit. His Shoulder (as his Relations ſay) was ſtruck down, and in a manner ſevered from his Body.

Thomas Burroughs ſat as looking up to the Heavens, His Head turning toward one ſide, as viewing the Clouds, his Eyes open. He had, in his Pocket, a Copper Tobaccow-box, which had one little round Hole ſtruck quite through it; and a little of the Mettal on one ſide, ſeemed to have run. By theſe Poſtures, it is evident they died in a Moment.

Mr. *Edwards* adds, that he took *Simon Marriot*'s Hat, and ſome of his Cloaths, and held them againſt the Light, and they appeared full of Holes, as a Skimmeror Colander. But (at which he wondered moſt) the Woman who laid him out told him, their Buttocks which ſat upon the Ground were pittifully mangled, and their Privy Members rent and torn in Pieces; and more eſpecially thoſe of *Thomas Burroughs*, as if ſmall Bars of red hot Iron had been thruſt up into them in many Places.

The Hair of their Heads was burnt very much. Some had no Harm that were hard by; but others were wounded at a Diſtance, and their Wounds were cured with more Difficulty than ordinary Burns.

It was (before the Storm) a pretty ſtill Day. But before each Thunder-clap, was heard a great whirling Noiſe in the Trees, like Wind. The Lightning was obſerv'd, by Perſons at a Diſtance, as falling perpendicularly upon them.

Thoſe who recovered had their Cloaths full of Holes, as if they had been ſhot through. Not a Drop of Blood appeared upon any of them. Their Hurts like Dry ſcarred or healed Wounds.

Simon Marriot, and *Robert Marriot* were ſtruck back; the other Two (ſupported, as is ſuppoſed, by the Hedge at their Back) continued in the Poſture wherein they were killed, Three or Four Hours after, when Mr. *Butler* ſaw them.

The Eight Perſons who were hurt, but not killed, were *John Bird*, and *Mary* his Wife, *William Gregory*, and *Mary* his Wife, and *Mary* his Daughter, *Elizabeth Dod*, and *John Tibbe*, (all of *Everdon*) and *Thomas*—— Apprentice to *Burroughs* of *Badby*. Several others were ſtruck down, but not much hurt. Several of thoſe hurt, were taken up for dead, but ſoon came to themſelves without any Application; but ſome of them were fain to be carried home.

Gregory's Wife had Four little Holes in her Knee, like Shot-holes; which turned to Sores, and had Cores come out of them.

Mary Bird (the Woman with Child) had all over her Body, near an Hundred Wounds, of one ſort or other; and Seventeen large Wounds, ſome as large as a Man's Hand; on each Arm one, and one on each ſide of her Belly. Out of moſt of her Wounds came Cores, ſome bigger, ſome leſs; the biggeſt were bigger than a Walnut, dry and black like Leather. She had Two Sores on the Soles of her Feet, but her Shoes and Stockings not touched. She ſat next to thoſe that were killed.

killed. She was taken out of the Ditch for dead, and was ſuppoſed to be killed (whereupon it was at firſt given out, that there were Five killed, but this one of the Five did recover); ſhe was ſenſible of the Stroke, and ſenſible that her Husband looked Pale, and then Swooned away. She and her Husband were both blooded; ſhe within an Hour after, and her Husband Eight Hours after; and they bled freely. Their Legs were mightily Swelled, before they were carried out of the Field. The Woman was very ſore and full of Pain, ſo that ſhe could hardly bear any Cloaths to touch her. She was Three Weeks ill before ſhe could riſe, and continued ill about a Quarter of a Year; no Medicines uſed for Burns did any Good, but occaſioned great Torment to her. The firſt that they perceived to do good was, Oil of St. *John's-wort*; and after the Cores were come out, the Black-Salve. She went out her full time, The Child had no Marks or Blemiſh at all upon this Occaſion; and is yet living. About that time of the Year, ſhe hath been blooded ever ſince. She finds a great Tingling, and hath little Pimples like Stinging of Nettles; and cannot be well till ſhe hath been blooded.

The Wounds of all thoſe that were hurt, were like thoſe of this Woman; but ſlighter; and ſome of them had no Cores came out of them.

This is the beſt account I can give you of this Matter; which I have put together as well as I could, out of the broken Remarks which I had in Writing from the Two Gentlemen above mentioned; and, as near as might be, in their own Words.

As to my Thoughts of the natural Cauſes of the particular Accidents, I have little more to add to what I ſaid in my former Letter; but leave it to each one to judge as he ſhall think fit.

It

It ſeems to me to proceed from ſome Cauſtick Vapour (of a like Nature with the Ingredients of Gun-Powder) diſperſed in the Air from the Clouds downward, (theſe Clouds being at this time very low) which Vapour being in ſome Places thicker than in others, when it chance thto be fired, the Flame flies like Lightning, (as the Phraſe is) or fired Gun-powder, according as the Matter leads it, and makes more or leſs Exploſion here and there, as the Matter is more or leſs copious. It ſeems that in and over this Ditch, there was plenty of ſuch Matter; and perhaps even under thoſe who were thus killed or wounded: And then, it is not ſtrange that ſuch Effects ſhould happen, as are deſcribed; For the like would have happened if Gun-powder had been ſo fired. And if this Exploſive Quality were attended with that of Glaciation (as Thunder is after accompanied with Hail, Niter being a proper Efficient of both,) there might be ſuch Concretions, in the Nature of Hail as might (by ſuch Exploſion) be ſcattered like Hail-ſhot out of a Gun, and cauſe ſuch Holes as are ſaid to have been in the Cloaths and Feet of theſe Perſons. And what is ſaid to have been obſerved by others at a Diſtance, like a Ball of Fire falling down directly upon the Place, might be a Propagation of the Flame kindled above, and continued, as the Vapour directed it, to the Place (as would be in a Train of Gunpowder) and might there hurt ſome and ſpare others, according as it was here or there more Copious. For we are not to preſume that it was in all Places equally mixed.

And the Cores which came out of the Wounds, ſeem like Eſcars made by a Cauſtick or other Burnings: Of which Phyſicians and Chirurgeons are the proper Judges.

I take theſe Cores to be ſcorch'd Skin, mortified, (beat into the Fleſh by that Hail-ſhot) and appearing like burnt Leather: Which muſt be worked out before the Wound could be healed; as is uſual, when other Heterogeneous Matter is forced into the Fleſh.

That ſome of the People not far off, might be thrown down, and not otherwiſe conſiderably hurt, is not ſtrange; who might be within the Blaſt, though not within the reach of the Fire; as we ſee in the Exploſion of Gun-powder, (to which I take this to be very like) when Windows (and other things at a Diſtance) are ſhaken and ſhatter'd by the Blaſt, or great Concuſſion of the Air, though the Flame do not reach them.

III. *Some Additional Remarks on the Extracting the Stone of the Bladder out of thoſe of the Female Sex.* *By* Thomas Molyneux, *M. D. S. R. S.*

ABout Six Years ſince, a Paper of mine was read before our Philoſophical Society here in *Dublin*, and after publiſh'd in the Philoſophical Tranſactions, *Numb.* 202. Wherein I gave an Account of a Stone of an extraordinary bigneſs, ſpontaneouſly voided through the *Vthera*, by a Woman here in *Dublin*: And as a Corollary or Deduction from this Hiſtory, I there propoſed the Extraction of the Stone, by the gradual Dilatation of the *Vrethra*, or Neck of the Bladder, without any manner of Section. as the moſt ſafe and eaſy Way, and of moſt general uſe, for the freeing thoſe of the Female Sex from the Stone in the Bladder.

I then alledged two Inſtances of Fact, to prove not only the Reaſonableneſs, but the real Succeſs of this Practiſe; and I have been ſince ſtill more confirmed in that Opinion by ſeveral other ſucceſsful Operations I have ſeen of the like kind: but more particularly, by one lately performed in this Town on a Girl, between Eleven and Twelve Years Old, one *Sarah Jones*, that for Six Years paſt, has been ſeverely afflicted with all the painful and unuſual Symptoms of the Stone, but on the 16th of *October*, was happily relieved, by only dilating gently, the Neck of the Bladder, and then extracting a Stone of a very conſiderable bulk, without making any Inciſion at all.

The whole Operation was performed in Six or Seven Minutes, and was the more remarkable on the Account of the extraordinary large Size of the Stone, whoſe Shape and Bigneſs is exactly repreſented in the annext Figure, *Vid. Tab. Fig.* 1. I did omit taking the Weight of it, nor was it truly any great neglect, ſince I think it no very material Circumſtance for our Information in in ſuch Caſes, to know exactly what a Stone Weighs; for the greater or leſs Gravity of theſe Bodies, depend not on their outward Dimenſions, ſo much as on their internal Parts accidentally cohering more or leſs compactly together, as they are formed in the Bladder, and as if no importance in the Operation of extracting them: the Difficulty or Eaſineſs of which, as well as the Danger and Succeſs, more immediately depend, on the Magnitude and Shape of the Stone, rather than on its Gravity; ſo that if we have a right Idea of thoſe, 'tis altogether ſufficient to our Purpoſe.

By the Size of this we have here figured, it appears to have been ſo big, that it may ſeem almoſt incredible a Solid of that Bulk, ſhould be forced through the *Urethra* of ſo ſmall and ſo Young a Child, withont any manner

manner of Section: and that the Child ſhould recover ſo as to be perfectly well, without the leaſt ill Accident ſucceeding the Operation. But we may gather hence, of what vaſt Extention this Urinary Paſſage, though Naturally ſtrait, is capable; and how much ſtill wider it may be dilated, where 'tis proportionably larger, I mean of thoſe of this Sex of Riper Years, or grown up to Womens Eſtate; who may yet more eaſily and ſafely be relieved after this ſame manner, even of Stones of a much larger Size than this we here ſpeak of.

The *French*, a Nation certainly very ſubject to the Stone in the Bladder, and whoſe Chirurgeons therefore, muſt of neceſſity be very converſant with this Diſeaſe, and expert in the Operations requiſite for the Cure of it, have, I ſee, lately eſtabliſhed this ſort of Practice; tho' I muſt needs own I did not know ſo much, till I had peruſed a very uſeful Book of Chirurgery, Publiſhed but this laſt Year, 1696. at *Paris*, in 8*vo.* by Monſieur *de la Vauguion*; Entituled, *Traitè Complet des Operations de Chirurgie*: where I find in his Thirteenth Chapter, that treats of the Stone in the Bladder, and deſcribes the way of Extracting it out of Women; he has theſe Words: *On dilate l'Uretre avec le Dilatateur ſans rien couper, & 'lon tire la pierre avec un crochet ou bien avec de Tenettes.* And a little after; *L'Uretre de Femmes ſe dilate extraordinairement, ainſi il arrive rarement qu'on ſoit oblige de leur faire une Inciſion.*

Theſe Quotations may ſhew, how that right Reaſoning, together with due Experience, have not only ſuggeſted, but likewiſe approved and ſettled this way of *Extracting the Stone out of the Bladder of Women without Section.* When I was a Stranger to this Practice, I did only then propoſe it to be well conſidered of by the Judicious; but now that it proves ſo ſucceſful, I cannot

 but

but recommend it to the skilful Chirurgeon, as an Operation fit for general uſe in theſe Caſes, being both ſafe and eaſily Practicable, and alſo of great Benefit and Relief to no leſs than the Moiety of Mankind, when ever they are afflicted with this painful Diſeaſe. And to ſay truly, if Women in this caſe would but timely ſeek for help, they might with far leſs Danger and Pain be relieved of this torturing and laſting Evil, than they are delivered of a common Natural Birth.

I ſay timely ſeek for Help; that is, before the Stone is grown to ſo large a Magnitude, as not to admit this ſort of Operation; of which there may be ſome Inſtances, though I believe, as the attempting the Cure of ſuch will be very dangerous, ſo likewiſe they will be very rarely met with; for Experience Juſtifies what I have elſewhere obſerved, (Numb. 202. of the *Philoſophical Tranſactions*) that Women are not capable by Nature of breeding Stones in their Bladders of ſo big a Size as Men frequently do; which is moſt apparent from thoſe many Hiſtories of ſtupendious large Stones (I mean them of the greateſt Magnitude) Regiſtred by both *George* and *John Schenkius*, *Hildanus*, *Greonevelt*, the *Philoſophical Tranſactions*, and other Authors; all which that have hitherto occur'd to me, have been only found in Men: Whereas the largeſt I have heard of bred in a Womans Bladder, was not one fifth Part of what has been produced of this kind in a Man's.

In the *Philoſophical Tranſactions*, Numb. 222. there is inſerted an Account of the largeſt Stone I have yet heard of bred in a Man's Bladder: That mentioned by Mr. *Wood* the Chirurgeon, Numb. 209. of the ſame Tranſactions. taken out of a Woman, and as he thought, of a Prodigious Size, does not amount to near a Fifth Part of this: However, that is extraordinary in Mr. *Wood*'s Relation, that though it was extracted by Section, and the Mem-

Membranous part of the Bladder, as he ſays, cut in the Operation, yet the Patient recovered and became perfectly well.

But theſe, and ſuch like ſurpriſing Cures, I take to be erratick or Anomalous, if I may ſo call them; becauſe they happen ſeldom, and when they do, ſeem to be contrary to the ſetled Rules of Phyſick; and therefore can little avail in guiding a Man's Practice, according to the Saying, *Quæ Rara ſunt, not ſunt Artis:* And notwithſtanding ſeveral ſuch rare Caſes, daily Experience will vouch for the Authority of that Aphoriſm of *Hippocrates*, Κύστιν διαπεπτη θανατώδες, *cui Secta eſt veſica lethale eſt*, as not being founded on a few Examples or a Notion, but what commonly holds true, or as *Hippocrates* often expreſſes it, ὡς ἐπὶ τὸ πολὺ, *for the moſt part*, which is a ſufficient, and indeed the only Principle on which we may conſtitute a ſtanding Rule in Phyſick; for as the Judicious *Celſus* has truly obſerved in his Preface to his Book *de Re Medica, Vix ulla Perpetua Præcepta Medicinalis Ars recipit.*

IV. *Eclipſis Lunaris Obſervatio, facta Roterodami die 29. Octobris Anni 1697. N. S. A Jacobo Caſſini, R. Ac. Pariſienſis Socio.*

ECliplis Lunæ diei 29 Octobris anni 1697. obſervata eſt Roterodami per Teleſcopium quatuor ferè pedum Pariſienſium oculari convexo in cujus foco erant fila quatuor ſeſe in axe interſecantia ad angulos rectos & ſemirectos, ad Phaſes dimetiendas, macularumque Lunarium ſitum determinandum. Hoc Teleſcopium impoſitum erat fulcro habenti axem in ſitu parallelo axi mundi conſtitutum, ut poſtquam ad Lunam directum eſſet ad unius phaſis obſervationem, poſſet ad alias phaſes Obſervandas per Lunæ ſemitam ad occaſum revo-

lui. Ita autem primo dirigebatur ad Lunam, ut eo immoto permanente Lunæ limbus borealis ſuo motu ad occaſum raderet unum ex his filis quod ideo parallelum dicimus, licet ob motum Lunæ in declinationem motui Lunæ ad occaſum multo celeriori commixtum nonnihil ab equatore declinaret dum Lunæ diſcus in reliqua tria fila ſucceſſivè incideret. Horum trium filorum intermedium angulos rectos cum parallelo efficiens, rectum perpendiculare & verticale appellamus. Reliqua duo obliqua, quorum primum dicimus in quod prius Luna incidit, ſecundum obliquum in quod Luna incidit poſterius. Initio Eclipſis, quando Lunæ punctum borealiſſimum nondum in umbra erat immerſum, illud filo aptavimus parallelo. Deinde poſtquam tale punctum umbræ immerſum eſt, eidem filo aptavimus auſtraliſſimum Lunæ punctum. unde factum eſt ut quod filum initio fuerat primum, in aliarum phaſium determinatione fuerit poſtremum & primum evaſerit quod poſtremum fuerat initio. Cum autem Lunæ limbus filum parallelum percurreret, Lunæ centrum intelligebatur deſcribere Lunarem ſemitam huic filo parallelam quæ ab aliis tribus filis ſecabatur. Portiones autem hujus ſemitæ ſupponuntur proportionales temporibus quibus ipſas Lunæ centrum percurrit, inæqualitas enim motus proprii uniuerſali motui immixti exiguo tempore imperceptibilis eſt. Cum igitur Lunæ limbus parallelum percurreret, obſervabatur beneficio horologii pendulo inſtructi & diebus præcedentibus ad ſolem conformati tempus adventus Lunæ macularum aliquot & lunarium cornuum ad hæc tria fila & deprehenſum eſt hujus Eclipſis tempore Lunæ diſcum tranſire per filum rectum 2′ 24″ per fila verò obliqua 3′ 24″ ideoque ſemi diametrum Lunæ tranſire per rectum 1′ 12″ per obliqua verò 1′ 42″ differentiâ utriuſque tranſitus exiſtente 30″. Hinc Obſervato uno appulſu Lunæ ad quodvis horum filorum, vel uno egreſſu dantur omnes alii ad fila reliqua. Semidiameter Lunæ AB jacens in lunari ſemita ABCDEF pertranſit per ejus punctum quod libet dum centrum A, percurrit ſpatium ſibi æquale AB at alia ſemidiameter AK angulum rectum efficiens cum alia rectâ linea NCK ad punctum K in quo proinde Lunam continget in, K, ab ejus ſemita declinans angulo KCA, tranſit per ipſum filum CK, dum centrum Lunæ percurrit, AC, hypothenuſam

Vid. Tab. Fig. 2.

Vid. Tab. Fig. 3.

ſam trianguli rectanguli, AKC, eſtque tempus tranſitus ſemidiametri, AB, per filum perpendiculare Lunam contingens in B, ad tranſitum ſemidiametri, AK, per filum obliquum NCK, ut AB vel AK, ſinus Anguli ACK, ad AC, ſinum anguli recti, ſive radium. Filo igitur, NCK, faciente eum ſemitâ Lunæ Angulo KCA ſemirecto, & Angulus KAC in triangulo rectangulo ſemirectus erit, ideoque latera CK, KA, æqualia, erit tranſitus rectus ſecundum AB, ad tranſitum ſemidiameni AK, per filum obliquum NK, ut ſinus anguli ſemirecti ad ſinum anguli recti, ut 707 ad 1000, ſive ut 72″ ad 102″ vel 1′ 42″ fere, ut obſervabatur Lunaris centri ſemitâ exiſtente AH, Lunæ ſemidiametro ipſi perpendiculari, AM, ductâ MNO, parallela ipſi AH, ipſa congruet filo quod Lunæ limbus motu ſuo ad occidentem radet, quod ſecabitur ab obliquis, MCK, NGI & a recto NEP in puncto N quâ tranſit Axis Teleſcopii; facietque cum his filis Lunaris orbita duo triangula rectangula NEC, NEG, quæ ſupponuntur habere Angulos ſemirectos ad puncta N, C, G. Sunt ergo ſimilia & æqualia, habentque latera CE, EG, EN, æqualia ſemidiametro Lunæ AM. Si hinc inde ab interſectionibus C & G accipiantur in filis ipſi ſemidiametro æquales CR, CS; GI, GR, & in orbitâ CA, CF, GD, GH æquales CN, & jungantur AK, FS, DR, HI erunt ipſæ omnes equales inter ſe, efficientque ad fila angulos rectos ad K, S, R, I. Quare centro Lunæ exiſtente in A, Luna tanget primum obliquum in K & poſtquam centrum Lunæ venit ab A in C ejus ſemidiameter congruet lineæ CE, ideoque Luna tanget filum rectum in E. Poſtquam autem centrum Lunæ venerit ab A, in D, tanget ſecundum oliquum in R. Eſt autem AD æqualis Diametro Luna, nam cum GD ſit æqualis CA, addendo DC habebitur AD æqualis GC qui quidem eſt diametro Lunæ æqualis. Sed cum GD ſit æqualis CF ſi ab his auferantur æquales GE, EC erit FE æqualis ED et erit DF dupla, tantumque erit a contactu primo ſecundi obliqui in R ad contactum ultimum primi obliqui in S & poſtquam centrum Lunæ progreſſum fuerit in G ad diſtantiam ſemidiametri unius EG, Luna continget ultimo filum rectum in E. Lunæ centro progreſſo a G in H ipſa tanget ultimo ſecundum obliquum in I. Suppoſito igitur tranſitu recto Lunæ fieri 2′ 24″ ut obſervatum eſt.

Poſito ergo tranſitu recto lineæ fieri 2′ 24″ ut obſervatum eſt.

Poſito

	′	″	Differentia Contactuum ′	″
Posito Centro in A & contactu primi obliqui in K	0	0		
Centrum Lunæ erit in C & continget 1°. rectum in E.	1	42	1	42
Centrum perveniet in D & continget 1°. 2. obliquum in R.	2	24	0	42
Lunæ centrum erit in E filo intermedio perpendiculari.	2	54		
Centrum perveniet in F & continget ultimo 1. obliquum in S.	3	24	1	0
Centrum erit in G & continget ultimo rectum in E.	4	6	0	42
Erit tandem in H & continget ultimò 2. obliquum in I.	5	48	1	42

Huic calculo correspondebant ut plurimum observationes in hâc Eclipsi intrà secundum unum. *Vid. Tab. Fig.* 4. sufficiebat igitur in una phasi observare duos ex his transitibus in reliquis phasibus unum, ut reliqui omnes innotescerent, sed plures observabantur ad majorem evidentiam, cumque Luna in hâc Eclipsi majori parte temporis Nubibus tegeretur ex quibus per intervalla emergebat, in emersionibus ü observabantur transitus qui magis prestò erant.

Quod ad Lunares maculas attinet, observabatur transitus insigniorum magisque apparentium, paucæ enim aere nebuloso clarè distinguebantur, & quæ propiores erant Lunari orbitæ, tam per filum rectum quam per unum aut utrumque obliquorum, transitus autem per rectum semper medius est inter transitus per duo obliqua eundem angulum cum Lunæ semitâ efficientia: quare observatis duobus quibuscunque tertium inveniri poterat.

Comparatur autem transitus marginis præcedentis. Lunæ & maculæ per filum rectum ad habendam differentiam quam dicimus longitudinem maculæ a margine præcedenti: & transitus rectus maculæ comparatur cum obliquo ad habendam differentiam quæ æqualis est distantiæ viæ maculæ a semitâ puncti borealissimi radentis filum parallelum. Cum enim via maculæ ABC, parallela sit viæ marginis DEF, eosdem cum eisdem

filis

filis Angulos facit ſemirectos ad A & C, rectos ad B, unde angulus ad A æqualis eſt Angulo ad C, & latus BA æquale lateri BE latitudini maculæ B a filo FED. *Vid. Tab. Fig. 5.*

Datâ autem longitudine & latitudine maculæ datur ejus ſitus in Lunâ. Deſcripto quippe circa ipſam quadrato cujus latus AB, intelligatur congruere filo parallelo & ſit diviſum in tot æquales partes quot ſecundis Luna per filum rectum tranſit latera verò AC, BD, ipſi filo perpendicularia ſint in totidem ſimiliter partes æquales diviſa. Sumptâ in parallelis longitudine AE, CF & ductâ FE & in perpendicularibus latitudine AG, BH, quam æqualem dicimus viæ interceptæ inter rectum & obliquum determinatur ſitus maculæ, M, in communi harum rectarum interſectione. *Vid. Tab. Fig. 6.*

Quod ſpectat ad Lunæ cornua in Eclipſi, ipsâ determinari poſſunt ſolâ longitudine, modo ſciatur quo in ſemicirculo auſtrali vel Boreali ſint ut cornu I per longitudinem AE vel CF, recta quippe FE Lunæ marginem ſecat in duobus punctis L & I, quorum unum eſt in ſemicirculo Boreali alterum in Auſtrali. Poteſt etiam determinari ſolâ latitudine AK, vel BM, modo ſciatur quo in ſemicirculo orientali vel occidentali ſit punctum I. Ex lineis autem longitudinis & latitudinis illa exactiùs ſitum cornu determinat, quæ propior eſt centro, ut hic punctum, I, exactius determinatur longitudine quam latitudine; è contra punctum O exactiùs latitudine quam longitudine, idque ob minorem obliquitatem lineæ rectæ ad circumferentiam, quâ efficitur ut exigua variatio diſtantiæ magis ſit in circunferentiâ ſenſibilis. Alia ratione per obliquos tranſitus determinatur ſitus macularum & cornuum Lunæ, ſi linea AD parallela ſemitæ Lunari PQ, ipſius marginem tangenti fiat diameter quadrati Lunæ circumſcripti quæ dividatur in tot æquales partes quot ſecundis Luna per filum obliquum pertranſit, ut in hâc Eclipſi in partes 204. Hujus quadrati duo latera AC, BD, primum obliquum repreſentabunt, ut pote illi parallela, reliqua AB, CD ſecundum obliquum, ſumpta autem differentia inter tranſitum marginis præcedentis Lunæ & maculæ M per obliquum in ſecundis horariis ab angulo præcedente ab A in T, & ductâ per T rectâ EF parallela lateri, *Vid. Tab. Fig. 7.*

teri, AC, & similiter sumptâ ab eodem angulo A, differentia inter transitum marginis præcedentis K & maculæ M, per secundum obliquum AB, ut AV, per punctum V, ducatur recta GVH parallela lateri AB, repræsentabit 2. obliquum secans priorem in puncto M, ibique situm maculæ determinabit. Eadem ratione determinabitur situs cornu E per differentiam ipsius transitus & marginis per 1. obliquum sumpta, ut AT situs cornu H per differentiam ipsius transitus per secundum obliquum AB, ut AU, & ductâ per V, recta GH, parallele la lateri AD modo sciatur sit ne cornu in semicirculo præcedente aut sequente.

Die 29. Octobris, 1697. Roterodami Vesperè post solis occasum Cælum nubibus erat obductum. Visa autem est Luna inter Nubes horâ 6 18′ adhuc integra, in præludium autem observationum cæptus est determinari situs macularum, notato tempore transitus ipsarum per fila Telescopii, horologio quod (ut ex observationibus solis altitudinum æqualium, manè & vesperè eadem die, & præcedentibus, captarum deducebatur) ea horâ & sequentibus retardabat minutis 1′ 4″ quæ sequentibus observationibus addidi & ita ad veram horam sunt reductæ.

Cum ergo margo Lunæ Borealis filum parallelum raderet situs promontorii acuti quod propè Lunarem orbitam incidebat sic determinatus est.

	h	′	″	
A	6	29	36	Promontorium acutum ad primum obliquum.
B	6	21	27	Præcedens Lunæ margo ad perpendiculare.
C	6	22	3	Promontorium acutum ad perpendiculare.
Ergo C—B		0	36	Differentia transitus per filum perpendiculare quæ est longitudo promontorii acuti a margine præcedente.
C—A		1	27	Differentia transitus promontorii acuti inter 1. obliquum & perpendiculare quæ ejus est latitudo a margine boreali.

Ante-

Antequam aliarum macularum ſitus poſſet determinari Luna Nubibus eſt obducta.

	h	′	″	
	6	30	34	Luna inter Nubes conſpecta adhuc apparuit integra.

Prima Obſervatio Eclipſis.

	6	38	58	Luna è Nubibus emergens jam & margine ſuperiori filum perpendiculare radente, phaſis & aliquot macularum ſitus ſic determinatus eſt.
	6	41	1	Ex Sequentibus præcedens margo ad primum obliquum.
A	6	41	23	Initium Maris Criſii ad 1. obl.
B	6	41	50	Promontorium acutum ad 1. obl.
C	6	42	12	Plinius ad 1. obl.
D	6	42	25	Menelaus ad 1. obliquum.
E	6	42	33	Manilius ad 1. obliquum.
F	6	42	43	Primus margo ad perpendiculare.
G	6	43	0	Proclus ad perpendiculare.
H	6	43	20	Promontorium acutum ad perpendiculare.
I	6	43	26	Margo ſequens ad 1. obliquum.
K	6	43	30	Menelaus ad perpendiculare.
L	6	44	0	Cornu præc. Lunæ ad perpendiculare, ipſa tangit filum horiz.
M	6	44	21	Cornu ſequens ad 1. obliqum.
N	6	44	35	Menelaus ad 2. obliquum.
O	6	44	57	Cornu ſequens ad verticale.
P	6	45	7	Margo ſequens ad perpendiculare.
Q	6	45	33	Cornu ſequens ad 2. obliquum.
R	6	45	55	Grimaldus ad 2 obliquum.
S	6	46	49	Sequens Margo ad 2 obliquum.

Examen primæ Obſervationis.

P—F		2	24	Tranſitus Lunæ per perpendiculare.
S—I		3	23	Tranſitus Lunæ per 2. obliquum.
H—F		0	37	Promontorii acuti Longitudo a margine præcedente.

	′	″	
H—B	1	30	Promontorii acuti latitudo a Margine Boreali.
K—F	0	47	Menelai longitudo a margine præcedente.
K—D	1	5	Menelai latitudo a margine Boreali.
O—K			
L—F	1	17	Cornu præcedentis longitudo a margine præc.
	0	0	Latitudo nulla.
O—F	2	14	Cornu ſequentis longitudo a margine præcedenti.
O—M	0	36	Latitudo ejuſdem cornu a margine Boreali.
Q—O	0	36	Eadem latitudo.

Ad eundem modum aliæ obſervationes expenſæ ſunt rejectis iis quæ minimè inter ſe convenire videbantur. Hinc longitudines & latitudines cornuum deductæ ſunt, ubi deerat tranſitus per filum perpendiculare, is deductus eſt ex tranſitibus per duos obliquos diviſo bifariam tempore inter utrumque.

Phaſes.	Longitudo à Margine Præc.		Latitudo à Margine Bor.		Longitudo à Margine Præced.		Latitudo à Margine Boreali.	
a.	′	″	′	″	′	″	′	″
1	1	17	0	0	2	14	0	36
			Latitudo à Margine Auſt.				Latitudo à Margine Auſt.	
2a.	0	28			2	24	1	17
3a.	0	10	1	49	2	22	1	9
4a.	0	1	1	10	2	$23\frac{1}{2}$	1	$6\frac{1}{2}$
5a.	0	2	0	56				
6a.	0	3	0	53	2	24	1	16
7a.	0	6	0	42	2	22		
8a.	0	11	0	32	2	13	1	54
9a.	0	6	0	43	1	35		
10a.	0	0	0	54				

Ad deſcriptionem phaſium ſumpta eſt ſemidiameter umbræ æqualis diametro Lunæ cum duabus tertiis ſemidiametri ejuſdem quæ magis congruere viſa eſt.

In

In Secundâ Phasi in quâ Cœlum obscurum.

	h	′	″	
A	7	6	46	Margo præcedens ad perpendiculare.
B	7	7	8	Cornu præcedens ad verticale.
C	7	7	47	Cornu sequens ad 1. obliquum.
D	7	8	19	Margo sequens ad 1. obliquum.
E	7	9	4	Cornu sequens ad verticale.
	7	12	22	Umbra ad Manilium.

Situs Cornuum.

B—A	0	28	Cornu præced. longitudo a margine præcedente.
E—A	2	24	Cornu sequentis longitudo a margine orientali.
E—C	1	17	Cornu sequentis lat. a margine Australi.

In Tertiâ Phasi.

A	7	29	30	Cornu præc. ad 1. obliquum.
B	7	21	9	Margo præc. ad verticale.
C	7	21	19	Cornu præc. ad verticale.
D	7	21	51	Margo præcedens ad 2. obliquum.
E	7	22	24	Cornu sequens ad 1. obliquum.
F	7	22	47	Margo sequens ad 1. obliquum.
G	7	23	9	Cornu præcedens ad 2. obliquum.
H	7	23	31	Cornu sequens ad verticale.
I	7	24	40	Cornu sequens ad 2. obliquum.
	7	29	4	Umbra ad Dyonisium

Situs Cornuum.

C—B	0	10	Cornu præcedentis longitudo a margine orientali.
C—A	1	49	Cornu præcedentis latitudo a margine australi.
G—C	1	50	Eadem latitudo.
H—B	2	22	Cornu sequentis longitudo a margine præcedente.

H—E	1	" 7		Cornu ſequentis latitudo a margine auſtrali.
I—H	1	9		Eadem latitudo.

In Quarta Phaſi.

	h			
A	7	40	24	Cornu præcedens ad 1. obliquum.
* I	7	41	34	Ex ſequentibus margo præcedens ad verticale.
B	7	41	35	Cornu præced. ad verticale.
C	7	42	18	Margo præced. ad 1. obliquum.
D	7	42	44	Cornu præcedens ad 2. obliquum.
E	7	42	51	Cornu ſequens ad 1. obliquum.
F	7	43	14	Margo ſequens ad 1. obliquum.
* E+K	7	43	57½	Cornu ſequens ad verticale.
G	7	43	58	Margo ſequens ad verticale.
H	7	45	4	Cornu ſeq. ad 2. obl.

G— 2′ 24″ v I	7	41	34	Margo præced. ad verticale.
B—I		0	1	Cornu præc. longitudo a margine præced.
B—A		1	11	Cornu præc. latitudo a margine auſtrali.
D—B		1	9	Eadem latitudo.
H—E		2	13	Differentia tranſitus cornu ſequentis inter obliq.
K		1	6½	Dimidium lat. cornu ſequ. a marg. Auſtrali.
E+K	7	43	57½	Cornu ſequens ad verticale.
E+K—I		2	23′	Longitudo cornu ſeq. a margine præceden e.

In Quintâ Phasi.

	h	′	″	
*I	7	49	34	Margo præcedens ad 1. obliquum.
A	7	50	22	Cornu præcedens ad 1. obliquum.
B	7	51	4	Promontorium acutum in umbra.
*L	7	51	16	Margo præcedens ad perpendiculare.
C	7	51	18	Cornu præcedens ad verticale.
D	7	51	58	Margo præcedens ad 2. obliquum.
E	7	52	29	Cornu sequens ad 1. obliquum.
F	7	52	56	Margo sequens ad 1. obliquum.
D— 2′ 24″ v I	7	49	34	Margo præcedens ad 1. obliquum.
B —I		1	30	Longit. obl. Promontorii acuti a 1. obliquo.

Situs cornuum Quintæ Phasis.

D— 0′ 42″ v L	7	51	16	Margo præcedens ad perdiculare.
C —L		0	2	Cornu præcedentis long. a marg. præced.
C —A		0	56	Cornu præced. latitudo a margine australi.
E —I		2	55	Long. obliqua a 1. obl. ad maximam long. 3′ 24″.
		0	29	Complementum. Idem complementum.
F —E		0	27	Idem complementum. Medium 0′ 28″.

In

In Sextâ Phasi.

		h	′	″	
*	L	7	53	14	Margo præcedens ad 1. obl.
	A	7	54	6	Cornu precedens ad 1. obl.
	B	7	54	44	Promont. acutum ad 1. obl.
*	K	7	54	56	Margo præced. ad perpend.
	C	7	54	59	Cornu præced. ad perpend.
	D	7	55	38	Margo præced. ad 2. obl.
	F	7	55	52	Cornu præced. ad 2. obl.
	G	7	56	4	Cornu sequens ad 1. obl.
	H	7	56	36	Margo sequens ad 1. obl.
	I	7	57	20	Cornu sequens ad verticale.

D — 2 24 v	L	7	53	14	Margo præcedens ad 1 obl.
D — 0 42 v	K	7	54	56	Margo præced. ad perpend.

Situs Cornuum.

C — K	0	3	Cornu præced. longitudo a marg. præcedenti.
C — A	0	53	Cornu præced. latitudo a marg. australi.
F — C	0	53	Eadem latitudo.
I — K	2	24	Longitudo cornu sequentis a marg. præcedenti.
I — G	1	16	Latitudo Cornu sequentis a marg. australi.
B — L	1	30	Longitudo obliqua Prom. acuti a 1. obl.

In Septimâ Phasi.

*	I	8	5	51	Margo præced. ad 1. obl.
	A	8	6	58	Cornu præced. ad 1. obl.
*	K	8	7	33	Margo præced. ad perpend.
	B	8	7	39	Cornu præced ad perpend.
	C	8	8	15	Margo præced. ad 2. obl.
	D	8	8	21	Cornu præced. ad 2. obl.
	E	8	8	55	Medium umbræ ad perpend. ferè.
	F	8	9	14	Margo sequens ad 1. obl.

	h	′	″	
G	8	9	55	Cornu ſequens ad verticale.
H	8	9	58	Margo ſequens ad verticale.
C — 2′ 24″ v I	8	5	51	Margo præced. ad 1. obl.
C — 0 42 v K	8	7	33	Margo præced. ad perpend.
B — K	0	0	6	Cornu præced. long. a margine præcedenti.
B — A	0	0	41	Cornu præced. lat. a margine auſtrali.
D — B	0	0	42	Eadem latitudo.
G — K	0	2	22	Cornu ſequentis long. a marg. præced.

In Octavâ Phaſi.

A	8	23	53	Cornu præced. ad 1. obl.
* K	8	24	13	Margo præced. ad vert.
B	8	24	24	Cornu præced. ad perp.
C	8	24	55	Margo præced. ad 2. obl.
D	8	24	57	Cornu præced. ad 2. obl.
E	8	25	55	Margo ſequens ad 1. obl.
F	8	26	26	Cornu ſeq. ad perpend.
G	8	26	38	Margo ſequens ad vertic.
H	8	28	20	Cornu ſequens ad 2. obl.
C — 0′ 42″ v K	8	24	13	Margo præced. ad perpend.
B — K	0	0	11	Longitudo cornu præced. a margine auſtrali.
B — A	0	0	31	Latitudo cornu præc. a margine auſtrali.
D — B	0	0	33	Eadem latitudo.
F — K	0	2	13	Longitudo cornu ſeq. a margine præcedenti.
H — F	0	1	54	Latitudo cornu ſeq. a margine auſtrali.

In Nonâ Phaſi.

A	8	49	25	Cornu præced. ad 1. obl.
B	8	49	42	Eclipſis concavitas ad 1. obl.
* I	8	50	2	Margo præced. ad perpend.
C	8	50	8	Cornu præced. ad verticale.
D	8	50	41	Margo præc. ad 2. obliquum.

	h	′	″	
E	8	50	51	Cornu præc. ad 2. obliquum.
F	8	51	34	Cornu ſeq. ad verticale.
G	8	51	43	Margo ſeq. ad 1. obl.
H	8	52	26	Margo ſeq. ad verticale.
H — 0′ 24″ v I	8	50	2	Margo præc. ad perpend.
C — I	0	0	6	Longitudo Cornu præc. a margine præc.
C — A	0	0	43	Latitudo cornu præced. a margine auſtrali.
E — C	0	0	43	Eadem latitudo.
F — I	0	1	32	Long. cornu ſequ. a marg. præced. Latitudo cornu ſeq. deſideratur.

In Decimâ Phaſi.

* L	9	3	38	Margo præcedens ad 1. obl.
A	9	4	29	Cornu præcedens ad 1. obl.
B	9	5	4	Umbra recedit a Plinio.
* H	9	5	20	Margo præced. ad verticale.
* I	9	5	23	Cornu præced. ad verticale.
C	9	5	53	Cornu ſeq. ad 1. obl.
D	9	6	17	Cornu præc. ad 2. obl.
E	9	7	2	Margo ſeq. ad 1. obl.
F	9	7	47	Margo ſeq. ad verticale.
E — 2′ 42″ v H	9	5	20	
D — A	0	1	48	Tranſitus cornu præced. inter obliquos.
M	0	0	54	Dimidium lat. Cornu Præc. a margine auſtrali.
D — M vel I	9	5	23	Cornu præc. ad verticale.
I — H		0	3	Longitudo.
E — 3′ 24″ v L	9	3	37	Margo præced. ad 1. obl.
F — 4 6 v L	9	3	41	Idem margo.
C — L		2	25	Longitudo obliqua cornu ſeq. a 1. obliquo.
	9	9	4	Umbra recedit a Langreno.
		9	19	Finis maris tranquilitatis.
		13	40	Ariſtoteles.
		14	39	Cleomedes.
		21	34	Finis.

Vid. Fig. 8.

V. *An Account of a Book, Entituled,*

HOrtus *Medicus Amstelodamensis*, sive Plantarum tam *Orientalis* quam *Occidentalis Indiæ* aliarumque peregrinarum *Descriptio & Icones.* Autore *Joanne Commelino* Urbis *Amstelod.* (dum viverit) Senatore. Et latinitate donatum, Notis & Observationibus illustratum a *Frederico Ruyschio*, M. D. Botan. Profess. &c. & *Francisco Kiggelario*, Amst. 1697. Fol. And to be sold by *S. Smith*, and *B. Walford*, in St. *Paul*'s Church-Yard. With many additional Remarks by *I. P. Fellow of the Royal Society.*

This Work is none of the least *Specimens* of Modern Magnificence and Improvement in the History of Nature, which though she opens daily such Mines and Treasures, yet is never like to be exhausted. The *Art* of *Calcography* has given to these Studies a new sort of Life and Perspicuity; the Beauty and Graces whereof, have drawn many Illustrious Persons abroad, into a kind of Emulation who should excel in this Noble and most useful Ornament: What the *English* want in this Part, they have made up in their Critical Methods in their Discoveries of *Non Descript Species*, and in their judicious References to the Synonimous Names of various Writers, whereby the terrible Vices of Confusion and Multiplicity have been very much corrected. For this I need name no more than a *Worthy Member of the Royal Society*, who has been pleas'd to shew such an admirable Skill and Talent this Way, as will hardly be match'd either in past, present, or future Ages.

The *Authors* of this Garden have here *described* and elegantly *Figured* above a Hundred several Plants, which take in order, with the Illustrations of many additional *Synonima*, not mentioned by the *Curious Publishers.*

1. Ranunculus *Æthiopicus* foliis rigidis, floribus ex luteo virescentibus *H. Amst.* p. 1. Tab. 1. perelegans *D. Franqueville*, foliis aculeatis *Lob. illust.* 135. Imperatoria Ranunculoides *Africana* enneaphyllos, Laserpitii lobatis foliis rigidis margine spinosis *Pluk.* Tab. 95. Fig. 2. Sphondilii Panacis rigido hirtoq; folio Planta *Africana*, caustica *P. B. P.* Umbellifera urens Capitis bonæ spei *Alm. Bot.* 198.

2. Alcea Carpini folio *Americana* frutescens, flosculis luteis semine duplici rostro donato *H. Amst.* p. 3. Tab. 2. *Viginiana* Carpini folio flosculis minimis luteis semine duplici rostro s. aculeo predito *H. Ox.* 528. S. v. Tab. 35. Fig. ult. Althea *Virg.*

bidens Pimpinellæ majoris acutiore folio, floſculis minimis luteis *Pluk.* Tab. 9. Fig. 6.

3. Chryſanthemum *Americanum* caule alato, flore aphyllo globoſo Aurantio foliis Baccharidis *H. Amſt.* p. 5. Tab. 3. cannabinum *Americanum* alatum fl. aphyllo globoſo aurantio Baccharidis foliis *Brey* pr. 2. *Ameri.* bidens alatum fl. parvo aurantiaco *Pluk.* Tab. 84. Fig. 3. Conyzoides caule alato *Curaſſavicum P. B. P.* Conyz. Curaſſ. Abrotani fem. flore aurantio *ejuſd. Sl. Cat. Plant. Jam.* 126.

4. Portulaca *Americana* latifolia erecta, floribus albis *H. Amſt.* p. 7. Tab. 4. & *P. B. P.* affinis *Amer.* tricapſularis erecta fl. albo, pediculis anguloſis *Pluk.* Tab. 105. Fig. 6.

5. Portulaca *Curaſſavica* anguſto longo lucidoque folio procumbens, floribus rubris *H. Amſt.* p. 9. Tab. 5. & *P. B. P. Alm. Bot.* 303. Amer. procumbens longo levique folio glauco, flore pulpureo pulchro Anagallidis *Breyn.* Prod. 2.

6. Blattaria *Zeylanica* flore amplo miniato *Cat. H. Amſt.* Ceyl. fl. amplo coccineo *H. Ejuſd.* p. 11. Tab. 6.

7. Linaria *Luſitanica* procumbens polygoni folio, fl. pallido ceruleo rictu. luteo *H. Amſt.* p. 13. Tab. 7. & *Cat. ejuſd.*

8. Convolvulus *Americanus* piloſus, fl. luteo, umbone purpureo *H. Amſt.* p. 15. Tab. 8. *Africanus*, ſive *Guineenſis* pumilis Sagittæ foliis fl. campanulato obſoleti luteo fundo purpuraſcente *H. Beam.*

9. Ricinus *Americanus* perennis, floribus purpureis, ſtaphid. agriæ foliis *H. Amſt.* p. 17. Tab. 9. *Indicus* piloſus trifidus vel quinquifidus floſculis atro purpureis in umbella aggregatis *Pluk.* Tab. 56. Fig. 2. *Braſilianus* perennis fl. purp. fol. Staph. nonnihil ſimili *P. B. P.* Amer. fol. Staphiſagriæ *C. B.* 432, & 518. minor Staph. fol. fl. pentap. purpureo *Sl. Cat. Plant. Jam.* 41. *Wild Caſſada* Jamaicenſibus.

10. Ricinus Tithymalodes *Americanus* lacteſcens & urens floribus albis *H. Amſt.* & *P. B. P.* lacteſcens Fici foliis ſpinulis mordacibus armatis *Pluk.* Tab. 220. Fig. 3. Frutex innominatus pungens & urens *Marcgr.* p. 79. Fig. *Brancamos* Luſit.

11. Euphorbium Cerei effigie caulibus craſſioribus ſpinis validioribus armatum *Breyn.* pr. 2.

12. Euphorbium antiquorum verum *H. Amſt.* p. 23. Fig. 12. Tithymalus *Indicus* Spinoſus & anguloſus lacte turgens acri *H. Beam.* T. aizoides triangularis nodoſus & ſpinoſus lacte turgens acri *Alm. Bot.* 370. *Schadida Calli* H. Mal. V. 2. Tab. 42. p. *Pada Nivuli* Bram. *Sidera Calli Zeyl. Ray H. Pl.* 878. 13. Ti-

13. Tithymalus *Indicus* arboreſcens ſpinoſus, Nerii folio *H. Amſt.* p. 25. Tab. 13. Zeylanicus ſpinoſus arboreſcens *P. B. P.* & Append. *Pluk.* Tab. 230. Fig. 4. Euphorbio & Tithymal. media affinis aizoides indica arb. ſpinoſa Nerii folio *Breyn.* Pr. 2. *Ela-calli* H. Mal. V. 2. Tab. 43. p. 83. *Nivuli* Bram. *Raii H. Pl.* 1888.

14. Tithymalus *Indicus* fruteſcens *H. Amſt.* p. 27. Tab. 14. & *Raii H.Pl.* 1710. ramoſiſſimus fruteſcens penè aphyllus *P.B.P.* aboreſcens caule aphyllo *Pluk. Tab.* 319. Fig. 6. aphyllus Planta Mauritanica *Imperati* 664. Fig. *Tiru-calli*, H. Mal. V. 2. Tab. 44. p. 85. *Portigalli vivuli* Bram.

15. Tithymalus Arboreus *Americanus* Cotini folio *H. Amſt.* p. 29. Tab. 15. & *Cat. Ejuſd.* Curaſſavicus folio Cotini Maſſinilia Sylveſtris *P. B. P.* Curaſſ. fol. Cotini triphyllos petalis floſculorum ſerratis *Alm. Bot.* 369. *Pluk.* Tab. 230. Fig. 3. Sirinamenſis arboreſcens Cotini ſ. Coccigriæ foliis & facie *Breyn.* Pr. 2.

16. Tithymalus *Curaſſavicus* Myrtifolius, flore papilionaceo coccineo parvo *H. Amſt.* p. 31. Tab. 16. & *P. B. P. Pluk.* Tab. 230. Fig. 2. T. vel T. affinis ſ. ſimilis aphyllus dictus, major indicus latifolius fl. Sanguineo aviculæ capitulum repreſentante *Breyn.* Pr. 2. T. ſimilis fruteſcens Amer. Myrtifolius fl. difformi rubicundo *Cat. H. Amſt.*

17. Planta lactaria Africana *H. Amſt.* p. 33. Tab. 17. Tithymali fortè genus Planta lactaria *Africana* Pini fructuum facie *Breyn.* Pr. 2. an T. Æthiop. aphyllos verrucoſus rad. tuberoſa *H. Amſt.*

18. Alcea *Bengalenſis* ſpinoſiſſima Acetoſæ ſapore, fl. luteo pallido umbone purpuraſcente *H. Amſt.* p. 35. Tab. 18. ſpin. *Madraſpatana* foliis profunde laciniatis Cannabis in modum pentaphyllea ſaporis acidi *Pluk.* Tab. 5. Fig. 4, Indica ſpinoſa magno flore ex albido flaveſcente *Com. in H. Mal.* A. Acetoſa Indica ſpinoſa, foliis profunde laciniatis flore ſubluteo amplo *Breyn.* Pr. 2. Althea indica ſpinoſa Acetoſæ ſapore fl. flavo pendente *P. B. P.* Zeylan. foliis aſperis profunde laciniatis foliorum Cannabis inſtar ſaporis acidi *H. Leyd.* p. 27. Acetoſa indica *Bontii* p. 113. Fig. *Narinam-pulli* H. Mal. V. 6. Tab. 44. p. 75. *Ambetti* Brach. *Fula Gafinhola* Luſit. *Krabben doorn* Belg. *Nelta* Hen. van Rheede. *Raii H. Pl.* 1901.

19. Alcea *Americana* annua fl. albo maximo, fructu maximo pyramidali ſulcato *H. Amſt.* p. 37. Tab. 19. annua Sirina-

menſis fl. amplo, fr. max. ſulcato, ſtriato pyramidali *Cat. H. Amſt.* Braſilianum fr. max. pyram. ſulcato *Alm. Bot.* max. Malvæ Roſeæ fol. fr. decagon. recto craſſiore breviore eſculento *Sl. Cat. Pl. Jam.* 98. *Ochroa*, *Okkoro*, & *Kinkanbau* Surinam. & *Okra* Jamaicenſibus dicitur.

20. Ciſtus Ledon flore maculâ nigricante notato *H. Amſt.* p. 39. Tab. 20. *I. B.* V. 2. L. 13. p. 8. Fig. *Chabr.* 97. C. Led. Laurinis foliis anguſtioribus fl. albo, unguiculis petalorum purpureis *Alm. Bot.* 101. Ladanifera Hiſpanica incana *CB.* 467. *Ray H. Pl.* 1009.

21. Oxys bulboſa Africana rotundifolia, caulibus & floribus purpureis amplis *H. Amſt.* p. 41. Tab. 21. an bulb. Afr. rotund. fl. purp. amplo *Breyn.* Pr. 2 ? affinis Planta bulboſa Afric. fl. purp. magno *Ejuſd.* Cent. c. 46. p. 102. Fig. Afr. fl. purp. magno rad. bulboſa *H. Leyd.*

22. Oxys bulboſa *Æthiopica* minor fol. cordato fl. ex albido purpuraſcente *H. Amſt.* p. 43. Tab. 22. an Afric. fol. & flore parvo albente rad. Aſphoeli *P. B. P.* Trifol. bulboſum fl. albo *Promont. bonæ ſpei* Bod. a Stapel in Theophr. 336.

23. Nerium latifol. *Indicum* fl. variegato odorato pleno *H. Amſt.* p. 45. Tab. 25. & H. Leyd. *Ind.* fl. rubeſcente pleno *Breyn.* Pr. 2. Ind. Latifol. fl. rubro & aliquando variegato pleno *H. Beam. Fula meſtica* Zeylonenſ.

24. Flos Clitorius Fl. ceruleo pleno. Phaſeolus *Indicus* Glycyrrhizæ foliis fl. amplo cæruleo pleno. *H. Amſt.* 47. Tab. 24.

25. Phaſeolus minimus perennis *Americanus* fl. luteo, foliis Aſari lanuginoſis ſolitariis *H. Amſt.* p. 49. Fig. 25. & *Breyn. Prod.* 2. unifolius *Occidentalis* Aſari venoſo folio diſpermos *Pluk.* Tab. 105. Fig. 1. Orobus *Americanus Aſari* folio ſingulari *P. B. Pr.*

26. Senna ſpuria Occident. odore Opii viroſo, fol. mucronatis glabris *H. Amſt.* p. 51. & *H. Leyd. Sl. Cat. Plant. Jam.* 148. Orobus *Braſilienſis* fl. luteo *Pajomirioba* Marcgr. *Raii H. Pl.* 912.

27. Chamæcriſta Pavonis major *H. Amſt.* p. 53. Fig. 27.

28 Æſchynomene ſpinoſa latifolia ſive Herba viva vel Mimoſa latifolia piloſo & ſubrotundo folio *H. Amſt.* p. 55. T. 28.

29. Æſchynomene fl. globoſo albido ſiliculis articulatis echinatis *H. Amſt.* p. 57. Fig. 29. an Mimoſa ſpinoſa 3. ſive foliolis Acaciæ anguſtioribus ſiliquis parvis echinatis *Breyn. Cent.* p. 40. c. 18. Fig ?

30. Æſchynomene ſpinoſa 5, ſive foliolis Acaciæ latioribus fron-

frondibus aculeos longiſſimos habentibus *H. Amſt.* p. 59. Fig. 30. & *Breyn. Cent.* c. 20. p. 44. Fig.

31. Æſchynomene mitis 1. *H. Amſt.* p. 61. Fig. 31. Wilde Dryve bonen *Curaſs.*

32. Tribulus terreſtris Americanus Chamæciſti flore, fructu ſpinoſo maximo *H. Amſt.* p. 63. Fig. 32. & *Breyn. Pr.* 2. ter. *Amer.* Argemones fl. flavo *Pluk.* Tab. 67. Fig. 4. ter. major *Curaſſavicus* P. B. Pr. *an.* ter. maj. fl. max. odorato *Sl. Cat. Plant. Jam.* 90 ?

33. Orleana ſive Orellana folliculis lappaceis *H. Amſt.* p. 65. Fig. 33. & *H. Leyd. Pluk.* Tab. 209. Fig. 4. *Sl. Cat. Plant. Jam.* 150. *Raii H. Pl.* 1771.

34. Phalangium *Æthiopicum* ramoſum floribus albis petalis reflexis *H. Amſt.* p. 67. Fig. 34.

35. Lilium *Zeylanicum* ſuperbum *H. Amſt.* p. 69. Fig. 35. Mendoni *H. Mal* V. 7. Tab. 57. p. 107. Methonica *Malab.* Nienghala *Zeylan.* Pluk. *Tab.* 116. Fig. 3.

36. Lilio-Narciſſus *Africanus* platicaulis humilis flore purpuraſcente odorato *H. Amſt.* p. 71. Fig. 36. *an* Narciſſus major *Indicus* ſerotinus *Cornuti.* c. 57. p. 155 ?

37. Lilio-Narciſſus *Ceylanicus* latifolius flore niveo, externe lineâ purpureâ ſtriata *H. Amſt.* p. 73. Fig. 37. maximus *Zeyl.* floribus albis umbellatis *Alm. Bot.* 219. Lilium *Zeyl.* umbelliferum floribus albis *H. Leyd.* Tolabo *Zeylan.* Belutta pola-taly *H. Mal.* V. 11. Tab. 38. p. 75.

38. Narciſſus *Ceylanicus* fl. albo hexagono odorato *H. Amſt.* p. 75. Fig. 38. & *H. Leyd.* Lilio-Narciſſus *Indicus* fl. albo hexagono *Alm. Bot.* 220. Lunula *Zeyl.* Catulli pola *H. Mal.* V. 11. Tab. 40. p. 79.

39. Narciſſus *Amboinenſis* folio latiſſimo rotundo, floribus niveis inodoris *H. Amſt.* p. 77. Fig. 39. an Allium *Amboinenſe* folio rotundo ſ. Cepa ſylv. *Amboinenſis* Rumphii *P. B. P* ?

40. Gratiolæ affinis fruteſcens *Americana* foliis Agerati ſ. Veronicæ erectæ majoris *H. Amſt.* p. 79. Fig. 40. & *Breyn. Pr.* 2. Capraria *Curaſſavica* Cabiritta *vulgo.* P. B. P. Lyſimachiæ purpureæ affinis *Americana* procumbens Anonidis vernæ fruteſcentis foliis ſingulari glabro *Pluk.* Tab. 98. Fig. 4. West India Thea. *Sl. Cat. Plant. Jam.* 90.

41. Gladiolo Æthiopico ſimilis, Planta anguſtifolia caule hirſuto, fl. rubicundiſſimo *H. Amſt. p.* 81. Fig. 41.

42. Siſymrichium *Æthiopicum* majus latifolium, fl. albis hexapetalis

apetalis lineis purpureis ſtriatis *H. Amſt.* p. 83. Fig. 42.

43. Siſynrichium *Æthiopicum* majus anguſtifolium fl. albis *H. Amſt.* p. 84. Fig. 43.

44. Siſynrichium *Æthiopicum* minus. latifolium fl. hexapetalo albo *H. Amſt.* p. 84. Fig. 44.

45. Amaranthus globoſus *Malabaricus* flore purpureo. affinis *Indiæ Orientalis* fl. glomeratis Ocymoidis folio *Breyn. Cent.* 1. p. 109. cap. 51 Fig. & *H. Amſt.* p. 85. Fig. 45. Amaranthoides *Indicum* monoſpermum, foliis Ocymaſtri capitulis purpureis *P. B. P.* Gnaphalio affinis Ocymaſtri folio, flore ex purpureo violaceo *H. Boſ.* & *Leyd.* Wadapou *H. Mal.* V. 10. Tab. 37. p. 73. Gondo *Bram.* Wadambu *Zeyl.* Fulo Buton *Malaiis.*

46. Polygala arborea Myrtifolia *Cap. Bonæ Spei,* fl. albis intus purpureis *H. Amſt.* p. 87. Fig. 46.

47. Angelica arboreſcens ſpinoſa ſ. Arbor Indica Fraxini folio, cortice ſpinoſo *Raii H. Pl.* 1798. Chriſtophoriana arbor aculeata Virginienſis Pluk. Tab. 20. Fig. 1. Arbor Spinoſa Fraxini Foliis *Virginiana* D. Morgan *Alm. Bot.* 98. & *H. Amſt.* p. 89. Fig. 47.

48. Aloe Succotrina anguſtifolia ſpinoſa fl. purpureo *Breyn.* Pr. 2. & *H. Amſt.* p. 91. Fig. 48. Americana Ananæ foliis flor. ſuaverubentibus, ex *Codice Bentingiano* Pluk. Tab. 140. Fig. 4. Indiæ Orientalis ſerrata ſ. Succotrina vera fl. phæniceis *H. Beam.* an A. *Amer.* ſerrata fl. coccineis *P. B. Pr?*

49. Aloe arboreſcens *Africana* H. Beam. & H. Amſt. p. 93. Fig. 49.

50. Arum *Æthiopicum* fl. albo odorato *H. Amſt.* p. 95. Fig. 50. Æth. fl. albo odorato, Moſchum redolente *H. Leyd.* Afr. fl. albo odorato *P. B. P.*

51. Arum humile *Ceylanicum* latifolium, piſtillo coccineo *H. Amſt.* p. 97. Fig. 51.

52. Arum polyphyllum *Ceylanicum,* caule ſcabro, viridi diluto, maculis albicantibus notato *H. Amſt.* p. 99. Fig. 52. A. polyphyllum Dracunculus & ſerpentaria dictum *Ceylonicum* caule glabro viridi diluto, maculis albicantibus notatis, majus & elatius *Cat. H. Amſt.* Schæna *H. Mal.* V. 11. Tab. 18. p. 35.

53. Arum *Ceylanicum,* polyphyllum, caule aſpero, maculis viridi fuſcis, viridi dilutis & albicantibus pulchre notato *H. Amſt.* p. 101. Fig. 53. A. Polyphyllum Dracunculus & ſerpentaria dictum *Ceylonicum* caule aſpero cum maculis viridi fuſcis & viridi dilutis albicantibus pulchre notatum, majus & elatius Cat. *H. Amſt.*

H. Amst. an A. polyph. Dracont. & Serpent. dictum folio ramoso Pæoniæ instar caule aspero *Zeylanicum* P. B. Pr.

54. Balsamina Cucumerina *Indica* fructu majore flavescente *H. Amst.* p. 103. Fig. 54. B. Cuc. *Ceylanica* fructu flavescente *Cat. Hort. ejusd.* Cucumis puniceus *Indicus* major *P. B. Pr.* pun. *Zeylanic. H. Leyd.* major seminibus alb. *H. Leyd.* app. 663 pun. *Indic.* fr. majore ex flavo rubente *Com. Not.* in H. Mal. Momordica *Ceyl.* fr. Pyriformi majore ex flavo rubente sem. albis *H. Beam.* Pandi-Pavel *H. Mal.* V. 8. Tab. 9. p. 17. Valli carati *Bram.* Maragosa & Folhas Margoseira com fruita grande *Lusit.* Groot Bierblad. *Belg.* Poncleii *Benghal.*

55. Ficoides vel Ficus *Americana* sphærica, tuberculata, lactescens fl. albo fructu rubro pyramidali *H. Beam.* & *H. Amst.* p. 105. Fig. 55. F. s. Melocactos mamillaris glabra, sulcis carens fructum suum undique fundens *Pluk.* Tab. 29. Fig. 1. Occidentale spinosum minus absque tomento *H. Leyd.* app. Echinomelocactos minor lactescens absque tomento cylindris strictioribus *P. B. Pr.* tuberosus, s. globularis minor ex *Hort. Fagel.* Sch. Bot. 33. Opuntia Echinomelocacti effigie tuberosa, fructu leviſſimo Amethystino *Breyn.* Pr. 2.

56. Ficus Indica s. Opuntia *Curassavica* minima *H. Beam.* & *H. Amst.* p. 107. Fig. 56. F. I. minima spinis breviſſimis munita ex *Hort. Fagel.* Schol. Bot. 33. Opuntia *Americana* minima spinis creberrimis tenuiſſimis *Breyn.* Pr. 2. *an* minima Indica *H. Pisani?* Forte etiam Ficus. Ind. omnium minima, spinulis tenellis undique armata ex *Virginia* Alm. Bot. 147. The *Pin-pillow.*

57. Ananas *H. Amst.* p. 109. Fig. 57. & *Sl. Jam.* 77. *Pis.* p. 195. *Ger.* 1550. Fig. *Acost.* & *Linscotti* I. B. V. 3. L. 25. p. 95. Fig. *Chabr.* 356. & 57. Fig. A. fructus *Bontii* p. 145. Anana s. Pina *Park.* 1626. Fig. Carduus Brasilianus foliis Aloes *C. B.* 384. The *Pine-Apple.*

58. Palma Prunifera humilis non spinosa *Insulæ Hispaniolæ* fructu Jujubino similis, officulo triangulo *H. Amst.* p. 111. Fig. 58. an Palma *Americana* non spinosa craſſis rigidisque foliis, caudice scabro in caput protuberante *P. B. P?* *an* P. *Amer.* foliis Polygonati brevioribus leviter serratis & nonnihil spinosis trunco craſſo *Breyn.* Pr. 2? & *Pluk.* Tab. 103. Fig. 2. & Tab. 309. Fig. 5?

59. Cupressus *Virginiana* foliis Acaciæ deciduis *Raii H. Pl.* 1408. & *H. Amst.* p. 113. Fig. 59. *Virg.* fol. Acaciæ cornigeræ paribus & deciduis *Pluk.* Tab. 85. Fig. 6. *Virg.* foliis Abietis mol-

mollibus atq; deciduis *Breyn.* Pr. 2. & rectiùs Abies *Virg.* foliis mollibus Mimosæ atq; deciduis *Ejusd.* Cup. *Virg. H. Tradescant.* Virg. foliis Acaciæ deciduis H. Leyd. Tlatizcan s. Cupressus *Amer.* fusa. *Hern.* 98. (ex sent. D. *Pluk.*) & *Raii* H. Pl. 1933. Cap. 80. Cupr. *Amer.* an Thuia *Theophr.* Cupresso similis cujus fructus *Habbel* huic assimulatur Park. 1477. Fig.

60. Manghala Arbor *Curassavica* foliis salignis *P. B. P.* & *H. Amst.* p. 115. Fig 60. Frutex innominatus 2 s. instar Salicis pumilæ foliis Salignis *Marcgr.* 76. Fig. Salix *Brasilienſis* 2da. capitulifera *Johnst. Dendr.* 446. Tab. 126. Alnus maritima Myrtifolia Coriariorum Button-wood *Bermudenſibus* vulgò *Pluk.* Tab. 240. Fig. 3. Alni fructu Laurifolia arbor maritima *Sl Cat. Plant. Jam.* 135. Alno affinis *Americana* Liguſtri folio, fructu spicato rubro *Breyn.* Pr. 2. & *Pluk.* Tab. 128. Fig. 2. *Jamaica* Button-Tree.

61. Nux *Zeylanica* Juglandis folio *P. B. P.* & *H. Amst.* p. 117. Fig. 61. Domba-Geddy *Zeylan.*

62. Ficus *Bengalenſis* folio subrotundo, fructu orbiculato *H. Beam.* Americana latiori folio venoso ex Curacao *Pluk.* Tab. 178. Fig. 1. an F. Indica fol. oblongo obtuso fr. minore pallide luteo sphærico *Sl. Cat. Plant. Jam.* 189. an F. arbor *Barbadenſium* Ligonis p. 69. Peralu *H. Mal.* V. 1. Tab. 28. p. 49. Vadhcè *Bram.* Pipal. *Benghal.* Ficus. Malabarensis fol. crassiusculo, majori, fructu gemino intensè rubente *Com.* nor.

63. Gujava alba dulcis P. B. P. & H. Amst. p. 121 Fig. 63. alba acida fr. rotundiori Indiæ Orient. Pluk. Tab. 193. Fig. 4. Guayava Ger. 1612. Fig. id. em. 1612. Fig. Park. 1634. Fig. Indica fructu mali facie *pulpa interiore alba I. B.* Var. V. 1. L. 1. p. 108. Fig. falſ. & *Chabr.* Var. p. 5. Fig. falſ. Guajabo pomifera Indica *pulpa candida* CB. *Var.* 437. & Guajanos in Hispania nova, &c. Ejusd. 441 Pela & Pelouka *Mal.* Pera *Brach.* Guajavas *seu* Peera *Lusit.* Goejaves *Belg.* H. Mal. V. 3. Tab. 34. p. 31. *The large white Guava.*

64. Vitis Idea Æthiopica Myrti Tarentinæ folio, flore atro purpureo H. Amst. p. 123. Fig. 64. an Frutex Æthiopicus baccifer foliis Myrtilli Breyn. Cent. p. 9. c. 5. Fig.

65. Vitis Idea Æthiopica Buxi-minoris folio, floribus albidis H. Amst. p. 125. Fig. 65. an Frutex Æthiop. baccifer fol. Myrtilli alter Breyn. Cent. p. 10?

66. Amaranthus baccifer Circeæ foliis H. Amst. p. 127. Fig. 66. bacc. Indicus minor Circeæ folio & facie H. Beam. 1. semine

ſemine & facie Americana foliis Circeæ *P. B. P.* & Helitropium Curaſſavicum Scammonii foliis mollibus ſubhirſutis *Ejuſd.* Amer. majus foliis Populæ nigræ languinoſis fl. albo minimo *Breyn.* Pr. 2. & Monophyllum Amer. Circeæ foliis & facie fl. albo parvo *Ejuſd.* Pr. 2. Solanum racemoſum Americanum minus *Sl. Cat. Plant. Jam.* 85. Barbadenſe racemoſum minus tinctorium Circeæ foliis mollibus & incanis *Pluk.* Tab. 112. Fig. 2. an Seconde plante gueriſſante le mal des dents Du Tertre p. 92 ?

67. Malus Americana trifolia, fructu pomi Aurantii inſtar colorato. *Arach Simmeron.* vulgò *H. Amſt.* p. 129. Fig. 67. an Anona trifolia, flore ſtamineo, fructu Sphærico ferrugineo ſcabro minore Allii odore *Sl. Cat. Plant. Jam.* 205 ?

68. Malus *Americana* Lauroceraſi folio venenta, *Mancinello* arbor ſeu *Maſſinilia* dicta *H. Amſt.* p. 131. Fig. 68. Juglandi affinis arbor julifera lacteſcens venenata Pyrifolia, *Mancanilla* Hiſpan. dicta *Sl. Cat. Plant. Jam.* 129. *The Manchaneel Tree.*

69. Anona *H. Amſt.* p. 133. Fig. 69.

70. Malus Americana ſpinoſa, Portulacæ folio, fructu folioſo, ſemine reniformi ſplendente *Blad-appel* vulgò. *H. Amſt.* p. 135. Fig. 70.

71. Arbor Americana Cucurbitifera, folio longo mucronato, fructu oblongo *H. Amſt.* p. 137. Fig. 71. A. Cucurb. folio longo mucronato ſ. Laurino *Raii H. Pl.* 1668. Cucurbitifera arbor Americana, folio longo mucronato fructu orbiculari, granis cordiformibus pulpa nigra involutis *Pluk.* Tab. 171. Fig. 1. Laurifolia Guineenſis *CB* 461. Arbor folio Lauri fructu Cucurbitæ *I. B.* V. 1. L. 1. p. fol. Lauri ex Guinea Chabr 5. Fig. tranſpoſitâ.

72. Sebeſtena domeſtica *CB.* 446. & *H. Amſt.* p. 139. Fig. 72. Sebeſten Park. 252. Fig. Seb. Myxa ſive Myxaria Ger. 1315. Fig. id. em. 1499. Fig. Domeſtica Alp. Ægypt. 12. Fig. Myxa domeſtica ſ. Seleſten *IB.* V. 1. L. 2. p. 197. Chabr. 12. Fig. Prunus Sebeſtena *Matthioli H. Lugd.* & *Pluk.* Tab. 217. Fig. 2. *The true Sebeſten or Aſſyrian Plumb.*

73. Jujube Americana ſpinoſa, Loti arboris foliis & facie, fructu rotundo parvo dulci *H. Beaum.* & *H. Amſt.* p. 141. Fig. 73. *Leguanaria* vulgò ſeu Arbor Arabica ſpinoſa foliis & facie Loti arboris *P. B. P.* an *I.* ſ. Zizyphus Afric. mucronatis foliis ſpinâ gemellâ *Pluk.* Tab. 197. Fig. 3.

74 Prunus Javanica Atriplicis foliis *Kakouſa* Javanenſibus *H. Beaum.* & *H. Amſt.* p. 143 Fig. 74. an Elemnifera Curaſſavica arbor *P. B. P?* & *Pluk.* Tab. 173. Fig. 5 ?

75. Ceraſus Jamaicenſis fructu tetrapyreno *H. Amſt.* 145. Cu-

raſſavica fr. tetrap. *Scinmeraka* Curaſs. *P.B.P.* & *H. Beaum. Simmerouke* Indiginis. Amer. Myrti conjugatis foliis fructu acerbo tetrapyrene *Pluk.* Tab. 157. Fig. 4. an Arbor baccifera, folio ſubrotundo, fructu ceraſino ſulcato rubro polypyreno, officulis canulatis *Sl. Cat. Plant. Jam.* 172?

76. Azadirachta Indica foliis ramoſis minoribus, fl. albo ſubceruleo purpuraſcente majore *Breyn.* Pr. 2. & *H. Amſt.* p. 147. Fig. 76. Azedarach floribus albis ſempervirens *H. Leyd.* app. Indica foliis non deciduis officulo polypyreno. *P.B.P.*

77. Terebinthus Americana polyphilla *P.B.P.* & *H. Amſt.* p. 149. Fig. 77. *Palamalatta* dictum *Pluk.* Tab. 228. Fig. 6. an major, Betulæ cortice, fructu triangulari *Sl. Cat. Plant. Jam.* 167?

78. Viburnum Americanum Urticæ foliis Lamii odore, floribus miniatis. *H. Amſt.* p. 153. Fig. 78. Amer. non ſpinoſum Meliſſæ foliis floribus coccineis P. B. P. *Pluk.* Tab. 114. Fig. 4. Amer. odoratum fol. Urticæ fl. miniatis *H. Leyd.* app. Pſeudo-viburnum Americ. Rivini 21. Periclymenum rectum Urticæ folio fl. coccineo amplo *Sl. Cat. Plant. Jam.* 164. Camara fl. rubro *Marcgr.* 5. Camara-juba Piſ. ed. 48. p. 86. Camaratinga *Ejuſd.* ed. 58. p. 176.

79. Meſpilus Americana Laurifolia, glabro fructu rubro mucilaginoſo *H. Amſt.* p. 153. Fig. 79. Calabura rubra foliis Laurinis P.B.P. & *Pluk.* Tab. 326. Fig. 5.

80. Meſpilus Americana Alni vel Coryli foliis, fructu mucaginoſo albo *H. Amſt.* p. 155. Fig. 80. Calabura alba *P.B.P.* & *Pluk.* Tab. 152 Fig. 4. & Tab. 326. Fig. 4.

81. Rhus Virginianum foliis Myrti *H. Amſt.* p. 157. Fig. 81.

82. Jaſminum Azoricum trifoliatum, flore albo odoratiſſimo *H. Amſt.* p. 159. Fig. 82. Az. fl. albo *Virid. Luſit.* Amer. trifol. odoratiſſimum fl. albo *H. Leyd.* app. an alb. trifoliatum fl. magno ex Inſula Maderenſi *Pluk.* Tab. 303. Fig. 1.

83. Lycio ſimilis frutex Indicus ſpinoſus buxi folio *Breyn.* Pr. 2. & *H. Amſt.* p. 161. Fig. 83. an Ebenus Jamaicenſis Arbuſcula Buxi foliis ſpinoſa, fl. luteo (papilionaceo ſiliquifera) *Pluk.* Tab. 89. Fig. 1? an Aſpalathus arboreus ſ. Pſeudo-Ebenus Buxifolio fl. luteo patulo, ſiliquâ latâ brevi chartaceâ, ſemen exiguum reniforme complectente *Sl. Cat. Plant. Jam.* 140?

84. Lycium Æthiopicum Pyracanthæ folio *H. Amſt.* p. 163. Fig. 84.

85. Ulmifacie arbuſcula Æthiopica ramulis alatis, floribus purpuraſcentibus *H. Beaum.* & *H. Amſt.* p. 165. Fig. 85. U. arbor Curaſſavica *P.B.P.* Ulmifolia arbor Africana baccifera floribus purpureis *Pluk.* Tab. 237. Fig. 1. Lycium Africanum non ſpinoſum Ulmi facie, floribus ſpecioſis *Alm. Bot.* 393.

86. Evo-

86. Evonymus Novi Belgii, Corni feminæ foliis *H. Amſt.* p. 167. Fig. 86. an Jujubinis foliis *Carolinienſis* fructu parvo ferè umbellato *Pluk.* Tab. 28. Fig. 6 ?

87. Evonymus Virginiana Ribeſii folio, capſulis eleganter bullatis *H. Amſt.* p. 169. Fig. 87. Anonymos Ribeſii foliis *Icon.* Roberti. *Raii H. Pl.* 1708. Americ. Ribeſii foliis, umbellatâ Melianthi capſulâ minore *Alm. Bot.* Spirea Opuli folio *El. Bot.* 490.

88. Guajacum Americanum Lentiſci fol. *H. Amſt.* 171. Fig. 88. fol. Lentiſci Hort. Fagel *Breyn.* Pr. 2. Amer. alterum fructu Evonyoni *Ejuſd.* Pr. 2. Jaſminum vulgò Americanum at *rectiùs* Evonymo adfinis Occidentalis alatis Ruſci foliis Nucifera, cortice ad genicula fungoſo. *Pluk.* Tab. 94. Fig. 4. *Pockhout* Belgis.

89. Arbor *Braſiliana* Myrti Laureæ foliis inodoris *H. Amſt.* p. 173. Fig. 89.

90. Arbor *Baccifera Indica*, foliis majoribus ſplendentibus flore pentapetalo *H. Amſt.* p. 175. Fig. 90.

91. Frutex *Æthiopicus* Portulacæ folio, flore ex albido vireſcente *H. Amſt.* p. 977. Fig. 91.

92. Rhus *Africanum* trifoliatum majus, foliis ſubtùs argenteis acutis & margine inciſis *Pluk.* Tab. 219. Fig. 6. Synonima hujus *Horti* malè adnectuntur.

93. Rhus *Afric.* trifoliatum majus, fol. ſurotundo glabro ſplendente *nob.* eſt varietas major ultimæ ſpeciei *Alm. Bot.* 319. Hic Figuratur p. 181. Cap. 93. ſub nomine *Vitis trifoliæ Indicæ rotundifoliæ*, ſed minus rectè cum ceteris cognominibus.

94. Nux *Americana* foliis alatis bifidis *H. Beaum.* & *H. Amſt.* p. 183. Fig. 94. N. A. coſtâ foliorum appendicibus aucta *Pluk.* Tab. 207. Fig. 4. Knippa & Tackboom *P. B. P.*

95. Arbor Camphorifera *Japonica* Breyn. Cent. p. 11. & pr. 1. A. C. *Jap.* foliis Laurinis fructu parvo globoſo calyce breviſſimo *Ejuſd.* Pr. 2. & *H. Amſt.* p. 185. Fig. 95. Camphora *Park.* 1675. Officinarum *C. B.* 500. Camphorifera arbor, ex qua Camphora Officinarum *H. Leyd.*

96. Staphylodendron *Africanum* ſempervirens foliis ſplendentibus *Cat. Hort. Amſt.* & H. *Ejuſd.* p. 187. Fig. 96. Afric. folio lucido *P. B. P.* Piſtachia *Africana* ſ. Staphylodendron *Æthiopicum* Μονολασιογαλλώμενοφυλλον ſingulari hirſuto folio nitente *Pluk.* Tab. 63. Fig. & Tab. 317. Fig. 5. Arbor quædam rariſſima lucens, fructibus Halicacabi *Breyn.* Cent. p. 177. & Halicacabum arboreſcens *Ejuſd.* 180.

97. Arbor *Virginiana*, Citriæ vel Limoniæ folio Benzoinum fundens *H. Amſt.* p. 189. Fig. 97. A. *Virg.* Piſaminis folio baccata Benzoinum redolens *Pluk.* Tab. 139. Fig. 3, & 4. Arbor *Benzoinifera* Breyn. Pr. 2.

98. Styrax arbor *Virginiana* Aceris folio, potiùs Platanus *Virginiana* Styracem fundens *Ray* H. Pl. 1799. & *H. Amſt.* p. 191. ſed *Figura* & *deſcriptio* hujus *Horti* aliam plantam potiùs repreſentare videntur, nimirùm *Acerem Virg. folio majore ſubtus argenteo ſupra viridi ſplendente* Pluk. Tab. 2. Fig. 4. quæ *Acer floreſcens Virginiana* vulgò dicitur.

99. Apocyno affinis *Portoricenſis* folio Haſtæ cuſpidi ſimili *H. Amſt.* p. 193. Fig. 99. A. *Portoric.* fruticeſcens foliis craſſis haſtæ cuſpidi ſimilibus *H. Beaum.* & *Pluk.* Tab. 137. Fig. 6. Tithymalus *Portoric.* fol. craſſis haſtæ cuſpidi ſimili *P. B. P.*

100. Lau-

100. Laurifolia *Africana* H. Amſt. p. 195. Fig. 100. *Swarte-Baſt* apud *Belgas* Promontorii Bonæ ſpei.

101. Sideroxylum *Africanum* Cerafi folio *H. Amſt.* p. 197. Fig. 101. an S. *Afr.* ſ. Lignum ferreâ duritie folio oblongo *P.B.P. Lignum ferreum* vulgò. *Ejuſd.*

102. Phyllanthos Americana planta, flores è ſingulis foliorum crenis proferens *P.B.P.* & *H. Amſt.* p. 199. Fig. 102. *H. Beaum.* Amer. anguſtiori & longiori folio ramoſa cauleſcens *Pluk.* Tab. 247. Fig. 4 Lonchitidi affinis arbor anomala folio alato è pinnarum crenis fructifero *Sl.Cat. Plant. Jam.* 16. Hippogloſſo fortè cognata Surinamenſis foliis Oleandri ſerratis, in crenarum extremo floſculos perminutos ſanguineos gerentibus *vel forte* Hemionitidi affinis Breyn. Pr. 2. *an* H. aff. *Amer.* epiphyllanthos folio ſimpliciter pinnato Hippogloſſi æmulo, radice reptatrice lignoſa ad foliorum crenas florida *Pluk.* Tab. 36. Fig. 7 ?

103. Erythroxylum *Japonicum* non ſpinoſum Coronillæ folio *H. Amſt.* p. 201. Fig. 103. Japanſche Blom-boom *Belg.*

104. Corallinum lignum *P.B.P. Pluk.* Tab. 169. Fig. 1. ſeu erythroxylum *Americanum*, Glycyrrhizæ folio, floribus ex luteo & rubro variegatis ſiliquâ latiſſimâ *H. Amſt.* p. 203. Fig. 104. Glycirrhiza vel (ſi mavis) Glycyrrhizæ affinis arboreſcens *Americana*, floribus ex luteo & rubro variegatis folio acuminato ſiliquâ latiſſimâ *Breyn.* Pr. 2. Corallen hout *Belg.*

105. Acacia *Javanica* ſulcata, caule & foliorum coſtis ſpinoſis *H. Beaum.* & *H. Amſt.* p. 205. Fig. 105. Durii ſpinge ricat *Malaiis* & *Javanenſibus.*

106. Acacia *Javanica* non ſpinoſa foliis maximis ſplendentibus *H. Amſt.* p. 207. Fig. 106. *Hort. Beaum.* & *Pluk.* Tab. 123. Fig. 3. Caduwang. *Javan.*

107. Acaciæ ſimilis ſpinis corniformibus *Mexicana* Breyn. Pr. 2. & *H. Amſt.* p. 209. Fig. 107.

108. Coral arbor Americana *H. Amſt.* p. 211. Fig. 108. Spinoſa occidentalis fructu intenſius rubente *P.B.P.* Coral arbor *Luſitanica* vulgò *Ejuſd.* Arbor Corallii *Ferrar.* flor. p. 380.

109. Draco arbor *Indica* ſiliquoſa Populi folio *Angſana* vel *Angſava* Javanica *H. Amſt.* p. 213. Fig. 109. deſcribitur in *Ephemer. German.* Ann. 13. Obſ. 37.

110. Caſſia fiſtula *Alexandrina* CB. 403. & *H. Amſt.* p. 215. Fig. 113. *Raii H. Pl.* 1746. & *Sl. Cat. Plant. Jam.* 145.

111. Caſſia fiſtula *Javanica* fl. carneo. *H. Amſt.* p. 217. Fig. 111. Indica fl. carneo *Clar. Sebaſtiani Jagërii* Breyn. Pr. 2.

112. Nux Been *Ceylanica* ſiliquâ triangulâ ſeminibus alatis *H. Leyd.* app. Balanus Myrepſica ſiliqua triangulari ſemine minore alato *Breyn.* Pr. 2. Moringa Lentiſci folio fructu magno anguloſo in quo Semina Ervi *IB.* V. 1. L. 12. p. 435. Moringo *H. Mal.* V. 6. Tab. 11. p. 19. *Luſit. Belg.* & *Acoſt.* Katu Murungha *Zeylan.* Arbor exotica Lentiſci folio *CB.* 399. Glans Unguentaria *Jonſt. Dendr.* p. 130. Tab. 43. Fig.

London: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the Princes Arms in St. *Paul's* Church-Yard. 1698.

PHILOSOPHICAL TRANSACTIONS.

For the Month of February, 1698.

The CONTENTS.

I. *Several Experiments concerning the Preserving of Flowers, Fruit,* &c. *Communicated by the Right Honourable Sir* Robert Southwell, *F.R.S.* II. *A Letter of Mr.* W. Derham, *Rector of* Upminster, *dated* Jan. 13. 169⅞. *to Dr.* Sloane, *about a Contrivance to measure the Height of the* Mercury *in the Barometer, by a Circle on one of the Weather-Plates, with a Register of the Weather,* &c. *for the Year* 1697. III. *Part of a Letter from Mr.* George Dampier, *Dated,* Exmouth, November 10. 1697. *to Mr.* William Dampier *his Brother, concerning the Cure of the Bitings of mad Creatures; with a Remark on the same by* Hans Sloane, *M.D.* IV. Observationes Sinenses, Communicatæ *à* D. Jacobo Cassini Acad. Reg.

Reg. Par. Soc. V. *A Letter from Dr.* Geo. Garden, *Dated* Aberdeen, Dec. 8, 1686. *concerning Caterpillars that deſtroy Fruit.* VI. Obſervatio de fæmina, quæ, non obſtante vaginæ uteri coaleſcentiâ infantem peperit. VII. *Account of Books.* 1. Numiſmata, *a Diſcourſe of* Medals, *Ancient and Modern; together with ſome Account of Heads and Effigies of illuſtrious and famous Perſons, in Sculps,* &c. *To which is added, a Digreſſion concerning Phyſiognomy. By* J. Evelyn, *Eſq; S. R. S. in Fol.* 2. *Caſpari, Bartholini Thom. F. Specimen Philoſophiæ Naturalis. Accedit de Fontium, Fluviorumque Origine Diſſertatio Phyſica.* Amſtelodam. 1697. 12mo.

I. *Several Experiments concerning the Preſerving of Flowers, Fruit,* &c. *Communicated by the Right Honourable Sir* Robert Southwell, *F. R. S.*

To Preſerve Flowers in a Book that may retain their Colours.

YOU muſt prepare Two Plates of Iron, large as an half or whole Sheet of Paper, or much larger, as you deſire to Preſerve Flowers of a great Size. Theſe

Theſe Plates muſt be too thick to bend, very ſmooth on one ſide, and Holes for Screws in each corner, to ſcrew them cloſe.

For your Flowers, Leaves, *&c.* take them when perfectly Ripe, and in their true Colours; ſpread them on a brown Paper, with the Leaves as diſtinct as you can; and if the Flowers be large, there muſt more Paper lye under it; and if it be thick, you may pare away the one half thereof, as alſo of the Stalk, ſo as to make it lye almoſt flat, and ſome diſtinct Leaves may be ſeparated and taken out, as a by Store, to be afterwards ſtuck in, and compleat the Flower. Then lay over all more brown Paper, and put theſe between the Iron-Plates ſcrewed cloſe, and put the ſame into an Oven for two Hours, juſt as the Bread is drawn. After which take out the Flowers; then take *Aqua Fortis*, and *Aqua Vitæ*, or Brandy, in equal quantity, mixed together, and with a Bruſh paſs over the Leaves of the Flowers. Then lay them on freſh brown Paper, and preſs them a little with a Handkerchief, or with your Fingers to grow dry. Then take the bigneſs of a Walnut of *Gum Dragon*, which, in leſs than Twenty four Hours, will be diſſolved in a pint of fair Water; and with a fine Bruſh, rub the back ſides of your Flowers and Leaves, to make them ſtick, and then lay them into your Paper-Book, where they will lye faſt, and always look freſh.

Memorandum, there muſt be a little Skill after the Oven, to turn the Leaves into ſhape, and a ſort of Perſpective, in caſe the Flower be too thick. And if you would add any ſmell to theſe Flowers, which will have none, touch them with ſuch Eſſence as you think fit.

To keep Fruit or Flowers the whole Year without ſpoiling.

℞ *Salt Petre one pound, Bole Armoniack two pounds, ordinary clean Sand three pounds; mix all together, and obſerve this Proportion in greater quantities.*

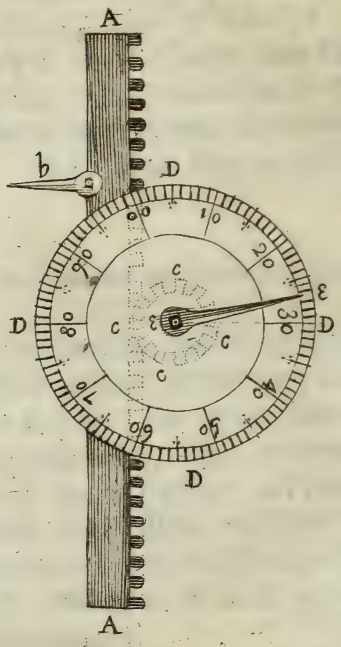
Then in dry Weather take Fruit of any ſort, that is not fully Ripe, each with its Stalk, put them in one by one into an open Glaſs, till it be full, and then cover it with Oyl'd Cloth cloſe ty'd down. Then in a dry Cellar put each of theſe Glaſſes four Fingers under Ground, and ſo as that quite round each Glaſs, and above and below, there may remain two Fingers thick of the ſaid Mixture. *N.B.* That Flowers muſt be uſed in the ſame manner.

To make Fruit and Flowers grow in the Winter.

Take up Trees by the Roots in the Spring, juſt as they put forth their Buds, preſerving ſome of their own Earth about the Roots. Set them ſtanding upright in a Celler until *Michaelmas*, then fit them into Veſſels, with an addition of more Earth, and bring them into a Stove, taking care to moiſten the Earth every Morning with Rain-Water, in a quart of which you muſt diſſolve the bigneſs of a Walnut, of *Salt Armoniack*, and about *Lent* Fruit will appear.

As to Flowers, take good Earthen Pots, and therein Sow your Seed at *Michaelmas*, watering it the ſame manner with the like Water, and by *Chriſtmas* you will have Flowers, as Tulips, Lillies, *&c.* This and the other may be done in a good warm Kitchin, and ſuch Days as the Sun ſhines, you may ſet forth theſe things for ſome Hours.

Philos. Transact. N°. 237



II. *A Letter of Mr.* W. Derham, *Rector of* Upminſter, *dated* Jan. 13. 169⅞. *to Dr.* Sloane, *about a Contrivance to meaſure the Height of the Mercury in the Barometer, by a Circle on one of the Weather Plates, with a Regiſter of the Weather, &c. for the Year* 1697.

TO my former Obſervations about the Barometer, give me leave to ſubjoin a Contrivance for meaſuring the Height of the *Mercury*, which hath lately occurred to my Thoughts, and which in ſome Caſes is more commodious, than that way with a crooked Tube (I ſpake of.) This way is by a Circle on one of the Weather-plates, of any convenient Diameter. Divide this into 100 Parts (which are to anſwer the 100 Parts of an Inch.) The Index which pointeth to theſe Parts, muſt be driven round by a ſmall wheel, like the Dial-wheel of a Watch. This Wheel muſt be driven round by a ſtrait Piece, like a ſmall Ruler, with Teeth on one Edge thereof; every Inch whereof muſt contain juſt the ſame Number of Teeth as are in the Dial-wheel before mentioned; ſo as that by the thruſting up and down this toothed Ruler, you may at every Inch turn round the Index once. About the middle of this toothed Ruler, a fine Finger muſt be fixed to point exactly to the Height of the *Mercury*. And conſequently by raiſing or depreſſing this Finger to the Height of the *Mercury*, you very exactly ſee, on the Circle, the Parts of an Inch, which the *Mercury* riſeth or falleth in the Tube, by reaſon the Circumference of the Circle is Three or more Inches about.

This Deſcription in Words may perhaps be ſufficient, but to prevent Obſcurity, I have added a Figure.

Having propoſed the niceſt ways I can think of, for meaſuring the Variation of the *Mercury* on different Heights, there is one Difficulty (partly ſuggeſted to me by a correſpondent Friend) which may be reſolved hereby, which I have not yet had Opportunity to make trial of, and do therefore recommend it to others. And that is, *Whether the Mercury hath exactly the ſame Variation, on one and the ſame Height, at two different Times:* viz. *When the Mercury is high, as in fair Weather; or low, as in foul:* I am inclined to think, That as the Atmoſphere is heavier or lighter, ſo its preſſure being more or leſs on the ſame Height, that conſequently the *Mercury* riſeth or falleth ſometimes more, ſometimes leſs on one and the ſame Height. As for Inſtance, If the *Mercury* ſinketh $\frac{1}{10}$ of an Inch at the Height of 82 Feet, when the *Mercury* ſtandeth at 30 Inches in the Barometer, I Quære, Whether it will ſink ſo much when the Barometer is at 29 Inches?

Fig. 1. repreſenteth the Circle and toothed Ruler, without the Interpoſition of the Weather-plate; that the Contrivance may be the better ſeen.

A. A. The Ruler with Teeth, made to ſlide up and down.

b. The little Finger that pointeth to the *Mercury*'s Height (which is placed higher on the toothed Rule than it ought to be, that it may be ſeen.)

c. c. c. c. The Index or Dial-wheel.

D. D. D. D. The Circle.

e. e. The Index.

The

The following Table explained, with Remarks upon it.

1. THE Four Columns in each Month are eaſy: The Firſt giveth the State of the Weather in the Morning, at Noon, and at Night. The Second the Bearing of the Winds. The Third, the Height of the *Mercury* in the Barometer, in Inches and Centeſimals. The laſt the Quantity of Rain that fell every Day through a Tunnel of Twelve Inches Diameter, in Pounds and Centeſimals of a Pound: At the Bottom of which Column is the Quantity of all the Rain that fell in the Month.

2. Where only one ſort of Weather is noted upon one Day, that was the Weather of all the Day; eſpecially if the Barometer be noted three times. The ſame obſerve alſo in the Column of Winds. Thus *Jan.* 2. it was a Miſling Day, Wind S.

3. The uppermoſt Obſervation of each Day is the Morning Obſervation; the middlemoſt at Noon; the lowermoſt at Night. Or if a Defect be in any of thoſe Three Places, no Obſervation was made at that time.

If you meet with [Rain] noted on the Line that parts every Day, it ſignifies rain fell in the Night.

4. The Time of obſerving at Night, was at Nine of the Clock all the Year. But the Morning Obſervations were all *January* at 8 of the Clock; all *February*, and to *March* 20. at 7 of the Clock; thence to the End of *September* at Six of the Clock; all *October* at Seven; all *November* and *December* at Eight: And this is the meaning of the Figures that follow the Name of every Month.

5. The Strength of the Winds is noted in the Column

of Winds, from *March* 25. The Reason I did it not before, was, because I did not think of it till Mr. *Townley* suggested it to me, *Note*, A Cypher signifies a Calm; 1, 2, 3, *&c.* denotes the Strength of the Wind; wherefore 5, or 6 is a little Storm; 7, or 8 a great Storm.

6. Where the Weather, Winds, or Rain are noted only in the Morning and at Night, it signifies the Weather, *&c.* all the Morning and Afternoon; especially if the Barometer was observed at Noon.

7. The Defect of Observations from *April* 26. to *May* 16. was occasioned by my Absence in a Journey: Notwithstanding which, I took Care to have the Rain that fell, measured; tho' not on the Days it fell.

8. Forasmuch as the Quantity of Snow falling can't be well observed by the Tunnel, I have therefore in the Table noted the Depth of it on the Ground, as on *Dec.* 4, *&c.*

9. The whole Quantity of Rain that fell through my Tunnel last Year, was 77,60 ℔. which is less than fell from the Beginning of *March* (at which time I began my Rain-Observations) till the End of *December*, 1696. In which Ten Months there fell here, at *Upminster*, almost 115 ℔. and at *Townley* in *Lancashire* (according to Mr. *Townley*'s Observations) above 172 ℔. and in the whole Year at *Townley* 203,75 ℔.

10. My Rain-Observations I make with a Tunnel of Twelve Inches Diameter (as I have said) the Rain I measure with a Cylindrical Glass. But for a fuller Description, I refer to Mr. *Townley*'s Account of his Method, in one of the Transactions of a former Year.

BRITISH MUSEUM
NATURAL HISTORY

A Regiſter of the Weather, Winds, Height of the Mercury in the Barometer, and Quantity of Rain falling every Day at Upminſter, *in* Eſſex, *the firſt Six Months of the Year One Thouſand Six Hundred Ninety Seven.*

January. 8. 12. 9.

	Weather	Winds.	Barom.	Rain.
1	Froſt	W. S. W.	30. 07	
			07	
	Fair		04	
2			05	
	Miſling	S.	06	
			05	
3	Fog	S. by W.	07	
	Cloudy	S.	11	
			15	
4			18	0. 50
	Miſling	S.	18	
			18	
5	Calm		22	
	and	W. by S.	23	
	Cloudy	S. W.	26	
6	Fog		22	
	Warm	W.		0. 30
	Miſling		14	
7		W. by N.	05	
	Cloudy	N. W.	05	
8		N. W.	29. 94	
	Cloudy	N. W.	90	
			82	
9	Sunſh.		51	
	Rain	S.	38	
	Snow		10	1. 20.
10	Froſt	S. W.	02	
	Thaw	S.	2. 00	
	Rain	S. by E.	28. 95	0. 70.
11	Cloudy		29. 46	
	Fair	N.		
			77	
12		N.	83	
	Sleet			
13	Cloudy			
			91	
		N. E.	96	
14	Snow	N. E.	96	0. 20
		E. N. E.	68	
15	Froſt	E. N. E.	94	
	Cloudy	E.	92	
			50	
16	Froſt	E. N. E.	90	
	Cloudy	N. E. b. N.	91	
			94	
17	Froſt	N.	30. 02	
	Cloudy	N. N. W.	02	
	Calm		04	
18	Froſt	W.	09	
	Fair	S. W.	10	
			10	
19				
20	Fair			
	Froſt			
	Cloudy	S. W. b. W.	20	
21				
22	Cloudy	W.	29. 95	
	Thaw	W. by N.	90	0. 08
	Rain		95	
23	Froſt	N. W.	90	
	Snow	N. W.	80	0. 30
	Fair	N. N. W.	68	
24	Snow	N. W. by W.	64	
	Storm	N.	67	
	Snow	N. E.	78	0. 20
		N. by E.	95	
25	Froſt	E.	95	
	Fair	E. by N.	97	
		N. E.	98	
26	Sharp	N. E.	96	
	Froſt	N. by E.	96	
		N. N. E.	86	
27			77	
	Froſt	N. E.	77	
			74	
28	Cloudy		65	
	Froſt	N. E.		
			60	
29	Snow	S.	47	
	Thaw	S. W.	31	0. 08
			29	
30	Froſt	S. W.	41	
	Fair	W.	50	
		W. by S.	54	
31	Froſt	W.	77	0. 05
	Fair	N. N. W.	86	
		N. by W.	95	3. 61

February. 7. 12. 9.

Weather.	Winds.	Barom.	Rain.
Froſt			
		30. 06	
Cloudy		05	
	N. E.		
Froſt		29. 95	
Cloudy	N. E. by E.	75	
Froſt	E.	66	
Calm	S.	50	
Cloudy		30	
Thaw	E. by S.	26	0. 02
Sleet		20	
Snow		20	
Fair	E.	20	0. 03
Froſt		19	
Froſt	N. by E.	05	
Cloudy		02	0. 03
Snow	N.	28. 90	
Snow	N.	86	
Cloudy	W. by S.	83	0. 01
	S. by W.	83	
Fairer		82	
Sleet	S. W.	84	0. 01
		97	
Thaw		29. 90	
Froſt	S. W.	18	
		25	
Froſt	S. W.	43	
Fair	S. W. b. W.	52	
		61	
Snow	S. by E.	65	
Rain	S. E.	76	0. 27
Fair	E.	94	
Cloudy	E. by S.	30. 08	
Froſt			
		08	
Thaw		00	
Warm	S.	00	
Cloudy		29. 95	
Calm	S.	88	
Rain	S. by W.	87	0. 40
	S.	80	
Miſt	N.	85	
Warm	N. W.	80	0. 30
Rain	E	80	
Cloudy	S. by E.	54	
	W. S. W.	62	0. 28
Fair		60	
Rain		50	
Fair	S.	52	0. 20
Rain		52	
Cloudy	S. by E.	30	
Bluſter.	S.	26	
Fair		42	
Rain	E. by S.	30	
	S.	33	0. 05
Fair		39	
	S. E.	46	
Froſt	E. by S.	46	
	E.	40	
Fair	E.	36	
		37	
		45	
Rain		47	
	E.	48	0. 03
Fair		52	
Hoar	E.	52	
Froſt	S.	54	
Fair	S.	60	
Rain		68	
Fair	S. by W.	75	0. 04
Rain		81	
Cloudy		84	
Bluſter.	S.	85	
Fair		88	
Fair	S.	88	
Cloudy			0. 10
Rain	S. W.	92	
Miſling	S.	93	
Fair	S. by W.	97	
Calm	S. S. W.	98	
Cloudy		30. 01	
Fair	S. W.	01	0. 03
Cloudy		40	
		Total	1. 80

March. 7. 12. 9.

Weathe	Winds.	Barom.	Rain.
Cloudy		30. 1.	
	S. W.		
Fair		20	
Cloudy	W. S. W.	18	
Warm	S. W.	19	
Spring		14	
Fog	S.	02	
	W.	29. 95	
Fair	W. by S.	88	
Miſt		75	
Rain	S. W.	69	0. 13
Fair		65	
Fair	S. W.	71	
Colder		70	
	S.	46	
Rain	S. W.	20	
Bluſter.	W.	12	0. 85
Fair		21	
Fair	W.	48	
Colder	W. by N.	57	
Bluſter.	W.	60	
Froſt	N. W.	30. 01	
	N.	11	
Fair	N. by E.	15	
Froſt	E.	15	
	W.	14	
Fair	S. W.	08	
Miſt.	S. W.	29. 95	
	S. W. by S.	90	
Fair	S. by W.	76	
Miſt	S.	65	
Froſt	W. by S.	64	
Cloudy		60	
Rain	N. W.	47	
Fair	W. S. W.	35	
Rain	W. by N.	21	
	N. by W.	18	
Rain	N.	25	0. 32
	N.	35	
Froſt	N.	59	
Fair	W.	60	0. 02
Cloudy	W.	48	
Fair		40	
Bluſter.	W.	48	
Storms		28	
Fair		04	
Hail	W.	04	0. 82
Snow		28. 93	
Froſt		29. 16	
	N. W.	30	
Fair		32	
Froſt	S.	10	
Snow	N. W.	10	
	W.	16	
Froſt	W. by S.	27	
Fair	N. W.	41	
	S. W. by S.	43	
Froſt	S.	42	
Snow	S. S. E.	37	0. 52
Fair	S. E.	25	
Bluſt.	E. by N.	07	
Cloudy	E. by N.	10	
Hazy	N. N. E.	24	
Froſt	N. E.	40	
Froſt	N.	46	
	N. N. W.	54	
Fair	N. by E.	70	
Froſt	N. by E. 1	78	
	S. 1	30. 02	
Fair	S. 0	11	
The	E. 0	11	
Same	S. E. b. E. 1	10	
		04	
		29. 97	
Same	E. 0	98	
		30. 07	
Same	E. 0	13	
Hazy	E. 0	15	
	E. 1.	20	
Cloudy	NE. b. N. 0	14	
Cold	N. N. E. 1	12	
		12	
Cloudy	N. 1	12	
Warmer	N. N. E.	12	
		05	
Cloudy	N. 1	96	0. 02
Rain	N. by E.	88	2. 68

April. 6. 12. 9.

Weather	Winds.	Barom.	Rain.
Cloudy		29. 83	
Warm	N. E. 0	83	
Fair		84	
	N. 1.	88	
Fair	N. E. 2	88	
		87	
Fair	NE. b. E. 1	83	
Want	E. 1	82	
of Rain		82	
Miſling	N. 0	75	
Cloudy			
Fair		68	
Cold		68	
Fair	N. by E.	68	
Miſling		74	
Froſt		73	
	E.	71	
Fair		68	
Froſt		66	
Dry Sea-	E.	67	
ſon		70	
Froſt		71	
	E.	70	
Warmer		71	
Fog	W.	66	
Fair	W.	64	
Cloudy		64	
Warm	E. 0	61	
and	E. by S. 1	61	
Fair		60	
Fair	E. 0	60	
Warm	E. 1	63	
Cloudy	N. by E. 2	64	
Fair	N. N. E. 2	65	
Cloudy	N. by E.	67	
Rain		70	
Cloudy		72	
Rain	N. E.		2. 38
		78	0. 30
	N. N. E. 0	75	
Fair	E. by N. 0	76	
		77	
Fair		77	
Warm	E. 1	77	
Spr. Day		73	
Fair	E. 0	73	
		75	
Cloudy	N. 0	86	
	N. by W. 1	96	
Fair		96	
	N. 1	94	
Fair	N. 0	91	
Hot	E. N. E. 0	93	
Day.		95	
		93	
The ſame	E. 1		
		80	
	E. 0	69	
The ſame	S. 1	60	
	S. 0	52	
Cloudy	E. by S. 0	35	
Fair	E. by S. 1	21	0. 43
Rain	S. by E. 1	10	
Cloudy	E 1	08	
Rain	S. 1	05	0. 30
Fair	S. E. 0	15	0. 62
Fair	E. 0	20	
Rain	S. by E. 1	22	0. 06
Fair	S. E.	27	
Rain	S. E. 1.	31	
	N. N. W.	32	1. 24
Thunder	E.	34	
Showers	E. by N.	28	
	E.	27	0. 75
Fair	E. 0	18	
Cloudy	S.	14	0. 65
			0. 80
		Total	7. 53

May. 6. 12. 9

Weather	Winds.	Barom.	Rain.
Cloudy			
Miſling		29. 65	3. 0
Bluſtr.	S. W. 2	55	
Rain	W. 2	57	
Fair	W. by N. 1	65	0. 19
		74	
	W. by S. 1	79	
Fair	E. 1	85	
		92	
Fair	E. by N. 0	99	
	N. 2	30. 02	
Cool	N. by E. 0	07	
Cloudy	N. 0	08	
Cold	N. by E. 1	08	
Fair	N. by E. 0	11	
	N. by E. 0	07	
The ſame	N. by E. 0	07	
	E. 0	02	
Cloudy	E.	29. 98	
Leſs Cold	E. by N. 0	93	
Fair	E. by N. 0	88	
	N. by E. 0	85	
The ſame			
	E. 0	88	
Moſt		88	
Hot and	E. 0		
Dry		85	
	E. 0	83	
The ſame	E. 1	80	
	E. 0.	73	
Fair	N. 0.	65	
Little	N. 1.	65	0. 01
Rain		75	
Fair	N. 0	82	
Warm			
	S. 0	74	
Fair	S. 0.	79	
Hot	E. 0	75	
	E. 1	73	
	E.	73	
The ſame		76	
	S. 0	80	
		80	
The ſame	S. 0		
		75	3. 20

June. 6. 12. 9

Weather	Winds.	Barom.	Rain.
Fair		29. 66	
Hot	S. 0		
Rain		56	
Rain	S. 0	42	
Shine	S. 1	29	0. 44
Rain	S. 1	10	
Fair	S. by W. 0	08	0. 79
	S. 1	04	
Showers	S. 1	02	0. 37
	S. W. 2	18	
Cloudy		38	
	S. 1	58	
Cloudy		72	
Sultry	S. by W. 1	83	
Hot		85	
Thunder	E. by S.	85	
Rain	E. 0	82	1. 13
Thunder		74	
Fog	S. by W.	70	0. 02
Fair	S. W. 1	71	
Hot	S. W. b. W	72	
Fair	S. W. b. W	70	
Cloudy	S. 0	56	
	S. by E. 0	50	
Fair	S. 1	48	
Rain	S. 0	51	
	S. by E. 0	60	
Fair	S. by W. 1	68	0. 20
	S. 0	75	
Fair	S.	75	
	S.		
	E. 0	65	
Cloudy	N. W. 1	60	
Fair	N. W. b. W	55	
	N. W. 0	49	
	W. 0	40	
Fair	S. W. 0	34	
	S. W. 0	28	
Fair			
			0. 20
Rain	E. 0	38	
Miſty	E. 0	45	
Fair			
Hot	N. b. W. 4	64	
Cloudy	N. 1	78	
		90	0. 01
Cloudy	N.	90	
Fair	W. 1	92	
Sultry	W. 0	94	
Very	W. by S. 0	98	
Drough-	W. by S. 1	30. 00	
ty.	S. W. 0	00	
Hot	S. W. b. W	29. 93	
	N. by E. 1	91	0. 22
Rain	N. E. 0	93	
Cloudy	N. by E. 2	92	
		92	
Cooler	N. 1	96	
Cloudy	N. 0	30. 00	
Much			
Cooler	N. E. 1	02	
	N. 0	01	
Fair	E. 1		
	NE. b. N. 0	29. 90	
Cloudy	N. 0	80	
Rain	E. 1	79	
Fair		79	
Great	NE. b. E. 1	77	
Drought	E. 1	78	0. 10
		78	
Cloudy	NE. b. E. 0	74	
Dry	N. E. 1	73	
	E. 1	71	
Sultry		71	
	E. 0	71	0. 05
Dry		73	
Miſt	E. 0	74	
Rain	E. by S.	73	0. 25
Thunder	S. 0	74	
Miſt		81	
Hot and	S. 1	83	
Dry		86	
Dry	E. 0	85	
Burning	E. 1	85	
Day	S. 0	87	
Fair	S. W. 0	88	0. 5
		88	
Rain	S. 1	80	0. 3
		Total	4. 1

Place this between Pag. 48, 49.

Philoſoph. Tranſact. Numb. 237. *Tab.* 1.

A Register of the Weather, Winds, Height of the Mercury in the Barometer, and Quantity of Rain falling every Day at Upminster, in Essex, the last Six Months of the Year One Thousand Six Hundred Ninety Seven.

July. 6. 12. 9.

Day	Weather	Winds.	Barom.	Rain.
1	Rain	S S W	29. 75	
		S W 1	72	
	Fair	S W o	70	0. 24
2		S W o	67	
	Same			
		S W 1	59	0. 22
3		W b. N 1	64	
	Fair		75	
		W o	84	
4	Cloudy	S o	85	
	Fair	S W 1	85	
	Hot	S W	85	
5	Fair	W o	87	
	Cool			
	Breezes	W 1	99	
6	Hot	W.o	29. 95	
	Dry	W.by S.1	94	
	Day		90	
7	Fair	W.by N.o	86	
	Hot			
	Rain	W.by S.o	79	0. 12
8	Misling	S. W. 1	68	
	Rain	S. W. 2	60	
	Cloudy	S. S. W. 1	44	0. 32
9	Rain	S. W. 1	42	0. 75
	Cool	S. W. 1	43	
	Fairer	W.NW.o	47	0. 77
10	Fair and	W.by N.o	58	
	Cool	W. 1	71	
		N.W.b.W	83	
11	Rain		85	
	Warmer	S. W. 1	85	
			92	0. 50
12		S.W.b.W	30. 00	
13	Fair and Hot	S. o	29. 98	
14	Fair	S. o	90	
		S.by W.1	88	
	Cloudy	S. W. 1	84	
15	Rain	N. b. W. 1	84	
	Cloudy	W. 1	85	0. 48
	Fair	N. W. o	90	
16	Cooler	W. 1	95	
	Rain	N.W b.W	94	
	Thunder		92	0. 42
17	Fair	W.by N.o	91	
	and	N. o	93	
	Cool	N.N.W.o	93	
18	Fair	N. W. 1	95	
	Cloudy			
	Rain	N. 1	98	
19	Misling	N.	93	
		W.N W 1	30. 00	0. 62
	Cloudy		30	
20	Showry	W.by S. 1	29. 88	
21	Rain	W.by W 1	75	
	Fair	W.by N.1	71	
	Misling	W. 1	60	
22	Misty	S.W.b.W	48	
	Rain			
	Fair	S.W.b.So	50	0. 45
23	Fair	S.by W.o	50	
	Cool	S. 1	48	
	Day	S. o	48	
24	Fair Thun	S. 1	50	
	Great Sh.	W. & N.	56	
	with Hail	& S.	60	1. 02
25	Fair	W. o	65	
	Pleasant	N. W. 1	72	
	Day	W.S.W.o	77	
26	Fair		76	
	Cloudy	W.by S.o	76	
	Misling		69	
27	Cloudy	S.by W.o	63	
	and	SE. Sb.W	60	
	Cool	E. by N.1	60	
28		N. N. E.2	58	
	The same	E. by N.2	62	
			69	
29	Fair	N. 1	70	
	Cool	N. 2	76	
	Day		90	
30		N.by W.o	77	
	The same	W.by N.1	30. 00	
			00	
31	Cloudy	S.by E.1	29. 90	0. 20
	Warmer	S. S. E.1	86	
	Rain	S. 1	79	6. 19

August. 6. 12. 9

Day	Weather	Winds.	Barom.	Rain
1		S. by E. 1	29. 73	
	Cloudy	S. by E. 2	72	
	Rain----	S. by E.2	65	
2	Fair	S. by E.o	63	0. 51
	Showers	W.by S.1	65	
	Fair		68	0. 40
3	Rain	S. by E 2	69	
	Cloudy	W. 3	71	
	Fair		78	0. 05
4	Rain	S.W.b.S1	69	
		S.by W.2	65	
	Fairer	W. 1.	60	1. 00
5	Rain			
		S. W. 2	50	
	Fairer	S. W. 1	49	0. 79
6		S.by W.o	47	
	The same	S. 1	[illegible]	
			45	0. 22
7	Cloudy	S. by E. o	51	
	Rain	E. by N.1	55	
	Fairer	E. N. E.1	58	0. 07
8		N. 2	50	
	Rain	N. 1	48	4. 0
	both	N. 2	35	0. 91
9		W. 2.	37	
	Days	W.by S.1	42	0. 50
			48	2. 20
10	Cloudy	W. 1.	60	0. 39
	Rain	N. W. 2	66	
	Fairer	W. 1	75	0. 07
11	Fair	W. o.	77	
	Pleasant	W. 1	80	
	Day	W.N.W 1	82	
12	Cloudy	W.by N.o	82	
		W.by N.o	82	
	Fair	N. o	85	
13	Mist	N. o.	88	
	Cloudy	W. by S.1	89	
	Rain.	S. by W. 1	83	0. 33
14	Cloudy	S. W. 2	78	
		W. 2	83	
	Fair	W. 2	88	
15	Cloudy	S. W. 1	84	
	Little	W.by S.2	81	
	Rain	S.W.b.W 1	75	
16	Cloudy		70	
	Fair	S. 1	62	
	Cloudy		53	
17		S. o	48	
18				
19				
20	Fair	S.by W.2		
	Great Stor.			
	Thun. Ra.		60	1. 88
21	Cloudy		60	
	Rain	S. 1	60	
	Cloudy		61	0. 13
22	Cloudy	W. by S.o	74	
	Misling	W. 1.	84	
	Fair	W.	90	
23	Fair	W.by S.o	92	
		W.by S.2	83	
	Cloudy	S. W. 2.	84	
24	Fair		82	
		S. W. 1		
	Sultry		78	
25	Cloudy	S.W.b.S1	70	
		S.W.b.S2	67	
	Fair	S. by W.2	54	
26	Rain	S. 3	29	
		W.by S.3	31	
	Fair		54	0. 53
27		S. W. 1	81	
	Fair	W.by S.2	93	
			98	
28		S.S.W.o	94	
	Fair	S. S.W. 2	94	
			90	
29	Cloudy	S. W. o	95	
	Sultry	E. o	99	
	Very Cl.		30. 03	
30		N. E. o	03	
	Fair			
31	Fair and Air sharp		01	13. 98

September. 6. 12. 9.

Day	Weather	Winds.	Barom.	Rain.
1	Fair	E. by N.1	29. 98	
		N. E. 2	30. 00	
	Cool		29. 98	
2		NE.b.N1	93	
	The same	N. E. 2	92	
			90	
3	Hot Sun	E.by N.o	88	
	but	E. 1	89	
	Cool Air	E.	89	
4	Fair	E. o	84	
	Warmer	E. 2	84	
	Air		80	
5	Fair	E. 1	78	
		E. o	80	
	Hot		83	
6	Mist	E. o	83	
	Fair	S. by E.o	86	
	Hot		87	
7		S. o	85	
	The same	E. 2.	83	
		E. o	80	
8		E. o	73	
	The same			
			70	
9	Fair	E. by N. 1	68	
	Cooler	E. by N. 2	66	
			56	
10	Cloudy	E. 1.	43	
		S. 2	39	
	Rain		40	0. 10
11		S. by E.o	38	
	Showers	W.S.W.1	40	
			60	1. 59
12	Fair	S. o	76	0. 07
		S.by W.2	77	
	Cloudy		70	
13	Rain	S. 2.	49	
		S. 3	38	
	Fair		63	1. 54
14		S. o	67	
	Rain	S. 2	50	
		S. 4	32	
15	Fair	S. W. 1	46	
			30	
	Rain	3	30	
16	Fair	S. W. 4	28	
	Cool	W.by S.6	32	
	Cloudy	2	34	
17	Fair	W. 1	45	
	Cool			
		o	75	
18		E. by S.o	55	
	Rain	S. S.W. 2	34	3. 10
		S. W. 2	10	1. 60
19	Fair	W.by N.o	38	
	Cloudy	S. W. 1	50	
	Rain	S. 1	32	0. 56
20	Rain	S. W. 3	05	
		W.S.W 3	02	
	Fair	3	21	0. 14
21	Cloudy	W.S.W 3	35	
	Rain	S. 1	31	
	Cold.	S. W. 1	28. 98	
22	Fair	S. W. 2	29. 24	
	Shower			
			38	0. 09
23	Fair	S. W. 1	51	
	Rain	W.N. W.	74	
24		S. W. o	87	
	Fair	N.		
	Rain----		87	
25		E. o	66	0. 08
	Cloudy	S. E. 2.		
	Misling		38	0. 30
26	Fair	N. E. o	38	
	Rain	E. 1	40	
	Cold		39	0. 24
27	Fair	E. o	27	
	Cloudy	E.by N.1	25	
	Rain		30	0. 84
28	Fair	N. E. 1	38	
	Cold	N. by E.3		
	Day		56	
29	Hoar	N.by W.1	65	
	Frost	N.by W.1	70	
	Fair		78	
30	Ice	N.by W.o	80	
	Fair		82	
	Cloudy		83	0. 22
31				10. 47

October. 7. 12. 9

Day	Weather	Winds.	Barom.	Rain
1	Cloudy	N. W. o	29. 75	
	Misty	S. 1		
	Warm	S. o	78	
2	Rain----	S. o	77	0. 10
	Cloudy	S. by E.o	75	
	Warm		70	
3	Cloudy	S. by E.o	51	
		S. 1	40	
	Rain		31	0. 72
4	Fair	SWb.W1	50	
	Cold	S. W. 2	52	
	Rain		28	
5		S. 4	00	1. 12
	Rain	S.by W.2	28. 98	
			29. 13	0. 57
6	Rain	S. 1	16	
	Stormy	E.&W.S.	28. 97	
	Fairer	S,&c. 6	29. 28	1. 36
7	Rain	S. by E. 1	08	
		N. 1	13	
	Fair	W. 1	58	2. 52
8	Rain	S. 2.	66	
	Cloudy	S. W. 4	64	0. 10
	Stormy	5	44	
9	Stormy Cloudy	S. W. 8	39	
	Fairer	W.S.W.4	51	
	Fair	2	66	
10	Fair	SWb.Wo	88	
	and	W.by S.o	30. 00	
	Pleasant		15	
11	Frost	W.by S.o	20	
	and		21	
	Misty	S. W. o	18	
12	Frost	SWb.Wo	17	
	Fair			
13	Fair			
		W. 1	20	
14	Fair	W.by S.o	18	
	and	W.N.Wo	18	
	Warm		16	
15	Cloudy	W.by S.o	12	
	Warm	N. W. o	12	
	Misling		10	
16	Cloudy	W. o	06	
	Fair	N N.W.2	08	0. 14
	Cold	N. by W.	20	
17		N.by W.o	27	
	Same	N.by E. 1	30	
			34	
18	Cloudy	N. by E.o	32	
	Fair		33	
	Colder	E.by S. o	27	
19	Hoar Fr.	S. W. o	22	
	Mist	N. by E.o	28	
	Fair		30	
20	Fog Frost	N. W.	28	
	Cold	S. W.	26	
	Rain		23	
21	Cloudy	W. S. 1	15	
		W.by S.1	16	
	Fair		20	
22		W.by S.o	25	
	Fog	S. W. o	25	
			25	
23	Cloudy	S. S. W.	22	
	Fair			
	Cloudy		15	
24	Cloudy	S. W. o	06	
	and			
	Warm		29. 94	
25		S. W. 2	80	
	Same	W.S.W.2	78	
			74	
26	Cloudy	S. W. 2	60	
	Warm	S. W. 6	52	
	Rain	6	27	
27	Fair	S. W. 2	37	1. 52
	Rain	SWb.W5	34	
	Stormy	o	88	0. 21
28	Frost	S. W. o	30. 08	
	Fair			
	Rain		29. 89	
29	Warm	S. W. 4	78	
	Small			0. 02
	Showers	3	74	
30	Cloudy	W.by S.5	48	
		W. 6	54	
	Fair		72	
31	Fair	N. o	30. 04	0. 01
	and	N. E. 2	17	
	Cool		26	8. 39

November. 8. 12. 9.

Day	Weather.	Winds.	Barom.	Rain.
1	Misling	S. 1	30. 19	
	Misty		15	
2	Fair	S.S.W.o	11	
	Warm	W.by S.o	11	
	Pleasant		07	
3	Fair	W. o	04	
	Colder	W.by S.o	02	
	Fog		29. 99	
4	Cloudy	SW.b.S.2	94	
	Cold		88	
	Day		80	
5	Rain----	S. W. 2	73	0. 50
	Fair	W. b. S.2	75	
			81	
6	Rain			
		W.by N.1	87	
	Fair			
	Cold		30. 00	
7	Cold	E. o.	29. 93	
	Cloudy	E. S. E.o	91	
	Day		92	
8	Frost	E. by S.o	96	
		E. S. E.o	99	
	Fair			
9	Hard		30. 10	
	Frost	E. o	10	
	Fair		10	
10	Cloudy	N. E. o	08	
	Frost			
	Fair		04	
11	Rain	W.by S.1	29. 73	
		N. 2		
	Fairer		72	0. 78
12	Rain	N.by W.2	70	0. 02
	Fair	N. 1	68	
	Frost		65	0. 15
13	Rain----	N. 1	63	
	Cloudy		62	0. 09
	Frost		56	
14	Snow	N. E. 2	40	0. 82
	Sleet	N. 1	38	
	All Day		48	0. 50
15	Frost	W. b. S.o	64	
16	Hard			
	Frost	N by W.2		
	Fair		30. 04	
17		N.b. W.2	03	
	The same	N.b.W.3	03	
			00	
18		N.N.W.1	29. 92	
	The same	N.N.W.o	91	
			76	
19	Snow	S. S. W.2	26	
	Sleet			
	Rain		28. 83	1. 20
20	Cloudy	N.b.W.2	82	
	Sleet	N. b. W. 3	82	
	Cold		93	0. 01
21	Cloudy	N. W. 2	93	
	Snow	W.by N.1	90	0. 18
22	Frost	N. o	95	
	Fair	N. 1	98	
	Sleet		29. 08	0. 09
23	Frost	N. W. 2	11	
	Fair			0. 13
	Snow----			
24	Fair			
			36	
25	Hard	S. o	36	
	Frost.	S. 1	37	
	Dripping		35	
26	Rain	S.E.b.S.2	21	0. 01
	Fairer	S. E. 2	08	
	Rain		00	0. 33
27	Fair	S.b.W. o	11	0. 20
	Thaw	S. 1	18	
	Rain		00	
28	Cloudy	S. o		0. 41
	Warmer			
	Rain		10	
29	Frost	S. S.W. o	15	0. 18
	Fair		19	
			19	
30	Small	W. 1	40	
	Frost &	W. by N.1	54	
	Fair		77	0. 03
31			Total	5. 63

December. 8. 12. 9

Day	Weather	Winds.	Barom.	Rain.
1	Hard	W. b.N.o	29. 86	
	Frost and	W. b. N.2	87	
	Fair		89	
2		N. 1	90	
	Same	N. o	94	
			99	
3		N. o	30. 05	
	Same	N. N.E.o	08	
			06	
4	Cloudy	N. W. 1	29. 98	
	Snow	N. N.W.1	89	
	Half Inch		96	
5	Cloudy	N.b. E. 2	30. 00	
	Fair	N. N. E.1	06	
			09	
6	Snow	NW.b.N3	29. 98	
	Fair	NW.b.N1	99	
	Sn. 1 Inch		30. 00	
7	Snow 6	N. W. o	29. 93	
	Snow 8	S. o	71	
	Inches		68	
8			84	
	Fair	E o	87	
			85	
9	Snow		64	
	Sleet	S. b. E. 1	53	
	Thaw		42	
10	Frost	E. N. E.o	55	
	Thaw	E. o	57	3. 61
	Snow	2	45	
11	Rain	E. S. E.2	09	2. 75
	Warm	S. b. W.1	10	
	Thaw		24	0. 9
12	Thaw	S. by E. 2	14	
		S. 2	04	
	Rain		11	0. 41
13	Fair	S. W. 3	33	
	Warm	W.S. W3	50	
	Pleasant	S. W. 1	61	
14	Cloudy	S. W. 1	68	
	Warm	W. S.W.1	67	
	Day	W. S. W.o	65	
15	Misty	E. 1	64	
	Warm	E. by N.o	64	
	Day		65	
16	Frost			
		E. by N.1	58	
	Fair		59	
17	Frost		57	
	Cloudy	E. o	56	
	Fairer		62	
18			64	
	Mist	E. o		
			72	
19	Cloudy		70	
	Warm	E. 1	68	
	Day		63	
20	Fog	E. 2	50	
	Cloudy			
	Colder		44	
21	Rain		45	0. 23
	Cloudy	E. 1.	51	
	Cold		62	0. 17
22	Rain----		75	0. 02
	Cloudy	E. 1		
	Fair		90	
23		S. by E. 1	83	
	Cloudy	S. 1	76	
			64	
24		S. by W.2	52	0. 46
	Rain	S. 2.	46	
	Stormy	6.	34	0. 56
25	Fair	W. 3	25	
	and	S.W. 2	40	
	Warm		61	0. 03
26	Cloudy	W. S. W.2	62	
	Fair	W. b. S. 2	70	
	Warm	3	87	
27	Cloudy	W. S. W.2	90	
	Misling		82	
28	Cloudy	S. by W.o	66	
	Rain	W. by S.3	56	
	Fair		75	0. 08
29	Fair	W. 2.	90	
	Cloudy	W.by N.2	97	
	Rain----	o	97	
30	Fair	N. E. 1	30. 10	0. 05
	Cloudy	N. E. 1	15	
	Fair		20	
31	Frost	E. o	18	0. 01
	Cloudy	E. b. S.o	15	
	Fair		08	9. 31

Place this between Pag. 48, 49.

III. *Part of a Letter from Mr.* George Dampier, *Dated,* Exmouth, November 10. 1697. *to Mr.* William Dampier, *his Brother, concerning the Cure of the Bitings of mad Creatures. With a Remark on the ſame by* Hans Sloane, *M. D.*

YOUR Laſt I did not anſwer ſooner, becauſe I had no Opportunity of ſending the Herb you ſent for (if I may call it ſo); I ſought Two or Three Miles about at firſt, before I found any of it, and afterwards found ſome of it as I was walking by the way ſide; both which I have ſent you. I have ſent it as it grew, without ſeparating the Earth, Moſs, and Graſs that grew about it, becauſe you may know it the better when you ſee it; you muſt look for it in dry Grounds; light and ſandy Ground, where Sheep feed, doth commonly afford it, but on Emett Butts, and Banks only; Rich Land doth ſeldom afford it, but our Unkle did prefer that that grows on good Ground, before that which grows on too light Sand, for he utterly refuſed what grew in our Rye-Field Grounds, and would look for it in ſtronger Land, ſaying, that though it was the ſame, it wanted Strength and Vertue, as the Land did it grows on. It is a ſort of *Jews Ear*, and I know no other Name for it, but *Aures Judaicæ*, or *Fungus Sambucinus*, which is properly the *Jews Ear* that grows on the *Alder*, this grows on the Ground as cloſe as may be to it, being flat on it, the Moſs and Graſs groweth up about and

am

amongſt it. To uſe it, you muſt dry it in an Oven, by the Fire, or in the Sun, then powder it, and paſs it through a Renge or fine Seive, the which mixed with the like Quantity of fine beaten and powdered Pepper, is the Compoſition. When given to a Dog, the Dog muſt firſt be blooded in the Ear, or otherwhere, if you know a more convenient Vein or Place, and then waſhed well all over, the Dog being kept from Meat a convenient while before, as a whole Night, or moſt part of a Day before, then mix it well in a convenient Quanti- of Milk or Broath warm: If it be for any Cattel, it muſt be alſo blooded and well waſhed and given with a Drenching Horn, and the Doſe may be proportioned to the Bigneſs or Strength of the Creature that is to take it: To a Man or Woman it muſt be given after Blood-letting, and well waſhing the Face and Hands, or Place that may be bitten, or all the Cloaths that the Perſon had on him or her, when bitten, to waſh away the Snivel or Drivel that comes from the Mouth of a Dog or other Creature when mad, for that is the only reaſon for Waſhing. A Man or Woman may take it in warm Milk, Beer, Ale, Broath, or how he beſt likes it, faſting, Two or Three ſeveral Mornings to make ſure; the more Ceremony you make in giving it, the more it ſeems to pleaſe ſome ſort of People. After a Dog hath bitten Man or Beaſt, it will not appear or begin to grow Mad till after a Full and New Moon, or New or Full; but when it begins to be Mad, 'tis very hardly cured; yet our Uncle *Dampier* hath cured both Man and Beaſt when Mad, but with much Care and Trouble, the manner which way, he hath alſo told me, and you may have the Receipt if it may pleaſe you: Therefore when you know any thing to be bitten, or ſuſpect it to be ſo, uſe the Remedy as ſoon as may be after, and then, when given in time, it prevents

prevents all Signs or Madneſs at all, which hath made ſome indiſcreet People ſay it did no Good, they believe it would have done well enough without it: But our Unkle hath fully confuted that Miſtake ſeveral times, by not Drenching a Dog of ſmall Worth ſometimes, in a Gentleman's Cry of Dogs, which hath died Mad, and not one of the reſt Sick, but have followed their Maſter's Game rather better than before. I am ſure that I had died, if I had not taken Three of my Unkle's Doſes Three Mornings Faſting, in Warm Milk, by the Bite of a Greyhound, for I eſcaped narrowly, it being almoſt too late: For I was Bit at *Cearn*, and knew not that the Dog had been Bitten by a Mad Dog, till after the Dog was Dead Mad, and a Meſſenger came to acquaint me of it on purpoſe, to *Coker*; therefore I can truly ſay, *Probatum eſt*. And indeed, being ingenuouſly prepared and given, 'tis a moſt Noble and Infallible Medicine. I have alſo ſent you Two Doſes of our Unkle's own preparing, which by Chance I had by me, and am never without ſome of it wherever I ſtay, by thoſe Papers you may ſee the Doſe that he commonly prepared, and may doe the like if you have occaſion for it: During his Life, I was under an Obligation to conceal the Receipt thereof to my ſelf, which, ſince his Deceaſe, I am diſingaged of, yet I ſhall hardly communicate it to any but your ſelf and my own Children. I was with my Unkle when a Dog had gotten in amongſt a whole Heard of Cattel at *Charmiſter* by *Dorcheſter*, and had bitten ſome, which growing Mad, and feeding together with their Fellows, when Mad, the Driveling of them infected many more, and the Diſtemper continued almoſt all the Summer amongſt them, ſtill One or Two Dying, and Infecting more; they drenched them for the Murrain, and went to Conjurers, and told them, they were Over-look'd by ſome unlucky Perſon, that had been deny'd ſomething deſired, or otherwiſe.

therwiſe croſſed, and had Spells and Charms for that Purpoſe; but all to no purpoſe: But I hearing the Circumſtances, imagined the Diſeaſe, and our Unkle being ſent for, found Three or Four Sick, which he could not cure, but ordered all the reſt to be driven Three or Four times through the great River, and all put from the ſame Paſture, till after it ſhould Rain a good Shower or Two, which would waſh away the Snivel from the Ground, and then Drenching them prevented any farther Evil, for not one was ſick afterward. And then alſo ceaſed thoſe ill Cenſures the Neighbours had of a harmleſs, long Nos'd old Woman or Two. The whole Heard was near Two Hundred and Fifty, about Forty died: They all acknowledged that he did them above a Hundred Pound's Worth of Good. This was much talked of by Hundreds of People, who knew the Truth of it. Much more may be ſaid of this Mad Matter, but enough I think at preſent.

Dr, *Sloane*'s Remark on the foregoing Account.

THE Simple or Herb mentioned in this Letter, is not Jews Ear, *but is the* Lichen Cinereus terreſtris, *deſcribed by Mr.* Ray *in his Hiſtory of Plants*, p. 117. *and grows commonly in moſt Barren Places about* London, *and all over* England.

The Weight of one ſingle Doſe of this Simple, and the Pepper mix'd, Communicated to me by Mr. Southwell, *with Mr.* Dampier's *Leave, is near* ℈iv.

IV. *Obſerva-*

IV. Obſervationes Sinenſes, Communicatæ à D. Jacobo Caſſini Acad. Reg. Par. Soc.

MIſſum eſt nuper à Patribus Societatis Ieſu in Regia Pekinenſi domicilium habentibus exemplar nonullarum obſervationum ibi habitarum ad ſitum illius Urbis determinandum conferentium.

Ex altitudine meridiana maxima ſtellæ polaris obſervata Die 31 *Decembris,* 1694. *correcto inſtrumento graduum* 42. 16. 50″. *Suppoſita refractione* 1′. 17″. *et diſtantia ſtellæ polaris a polo tunc temporis gr.* 2. 19. 57″. *eruitur altitudo poli gr.* 39. 54. 56.

Ex ejuſdem ſtellæ polaris altitudine meridiana minima obſervata Diebus 7, 8. 13 *Maii,* 1695. *correcto inſtrumento graduum* 37. 36. 40″. *ſuppoſita Refractione* 1′. 28″. *& diſtantia ſtellæ polaris a polo gr.* 2. 19. 50. *eruitur altitudo poli gr.* 39. 55. 2.

Neglecta Refractione altitudo maxima ſtellæ polaris deducta ex obſervatione 31 *Decembris præcedentis fuiſſet ſub initium Maii gr.*	42.	16.	43.
Et altitudo ejuſdem minima tunc fuit gr.	37.	36.	40.
Quare differentia altitudinum	4.	40.	3.
Et diſtantia ſtellæ polaris a polo	2.	20.	1.
Et altitudo poli apparens	39.	56.	41.
Ad hanc altitudinem apparentem refractio ex mea Tabula eſt		1.	10.
Quare altitudo poli in Regia Pekinenſi	39.	55.	30.

Plures aliæ obſervationes altitudinum meridianarum ſtellarum fixarum in hunc uſum habitæ ſunt ; ſed hæ mihi videntur omnibus præferendæ.

Pro longitudine Pekinenſis Urbis obſervatæ ſunt plures immerſiones primi Jovis ſatellitis in Jovis Umbram ex quibus ſelegi quæ habita eſt die 18 *Januarii*, 1695. *Teleſcopio pedum duodecim.*

Eo die obſervata eſt immerſio primi Jovis ſatellitis in Jovis Umbram facta correctione horologii h. 12. 51. 14.

Tabulæ noſtræ eo die hanc immerſionem repreſentant h. 5. 18. 49. *Obſervationes autem eodem menſe habitæ in obſervatorio Regio Pariſienſi oſtendunt. Tabulas retardaſſe tunc temporis minutis horariis* 2'. 30".

Quare fuit illa immerſio Pariſiis h. 5. 16. 19. *Itaque differentia meridianorum.*

*Inter Pekinum & Urbem Pariſienſem erit h.*7. 34. 55.

Cum autem ex aliis obſervationibus olim deducta fuerit eadem meridianarum differentia 7'. 36. *ſumi poterit h.*7. 35 ½.

V. *A Letter from* Dr. Geo. Garden, *Dated* Aberdeen, Dec. 8, 1686. *concerning Caterpillars that deſtroy Fruit.*

I Had Occaſion ſome Years ago to diſcover the true Origine of the ſmall Catterpillar, which infeſts the Bloſſoms of Pears and Apples, and deſtroys the Fruit. You know the vulgar Conceit was, their being bred of Miſts and Dews, which *Goedartius* goes along with, but Dr. *Liſter* rightly Conjectures their Original to be from the Butter-fly, into which they are transformed, though he ſeems not to have taken Notice of the particular manner of their Propagation, as may be ſeen in *Numb.* 60. of his Edition of *Goedartius.* The Bearers of theſe Trees you know are full of Aſperities, and not ſo ſmooth

ſmooth in their Bark as the other parts of the Tree. If after the Harveſt and any time all the Winter over, you look upon theſe Bearers through an ordinary Microſcope, you will find the Cavities there full of Eggs of an oblong Figure, and Citron Colour, eſpecially in thoſe Years and Trees wherein the Caterpillars have been numerous, out of theſe they are hatcht in the Spring. The Seaſons which uſually deſtroy them are, when there comes an early Heat, ſuch as is ſufficient to hatch them before the coming forth of the Buds and Bloſſoms, and when immediately there ſucceeds a nipping froſty Air, which ſoon kills them. The Diſcovery of this Manner of their Propagation, ſeems to give Light to theſe Conjectures. 1. That we ought not to conclude that any Inſects are bred of Corruption, and not *ex Ovo*, becauſe we cannot diſcern the particular manner of their Propagation; for the Diſcovery of this, you ſee, is by Accident, and not diſcernible by the naked Eye. 2. That the Female Inſects of all kinds of Flies and Butter-flies do probably put their Spaun near theſe Places, where the Erucas which are hatcht of them are to have their Food, ſo that they are to be ſearched for in ſuch Places, by thoſe who enquire into the Manner of their Propagation. 3. They ſeem to be fixed into the Cavities of the Bearers by a Gluten, ſo as that Rains do not waſh them off. 4. The greateſt Froſts, it ſeems, do no hurt to the ſmall Eggs of Inſects, for I have ſeen the Caterpillars hatch, after moſt Cold and Froſty Winters, of thoſe Eggs which I have obſerved on the Bearers all the Winter over.

VI. Obſervatio de fœmina, quæ, non obſtante vaginæ uteri coaleſcentiâ, infantem peperit.

AD fœminam ruri habitantem in puerperio enitentem, ante aliquot ſeptimanas accercitus eram, quæ parturientis doloribus per biduum laboraverat, abſque ullo tamen Effectu nam ne guttula quidem ſanguinis aut aquæ adhuc efluxerat, vetula obſtetrix quæ prius aderat mihi venienti retulit, ſe nunquam quampiam Viſitaſſe, cujus Uterus tam clauſus erat, quod cum exploraveram ita ſe habere ſenſi, nam Vagina Uteri (paulo ſupra ductum Urinæ) firmiter coaluerat & latera ejus tam arcte unita erant, ac ſi ſemper Unica eſſent membrana, nam ſpecillo non daretur tranſitus verſus Uterum (niſi membrana prius perforata) ab ejus marito interrogabam quam diu Vulva tam clauſa eſſet, reſpondit per quinquennium, viz. a tempore prioris puerperii, quo in difficili partu huic obſtetricaveram; quod coaleſcentia tam arcta erat non tactu ſolum, ſed viſu deprehendi: rebus ſic habentibus, puerperii ejus ſpem penitus abjeci, fefellit me tamen conjectura, nam poſt integram fere diem, multos ſorteſq; Enixos, una cum auxilio manus obſtetricis aliquantulum aperta (& ni fallor lacerata) erat membrana, adeo ut digito minori daretur ingreſſus: hanc apertionem (ut ad partum conduceret) per ſpeculum matricis dilatare viſum eſt, hoc facto magna hemorrhagia ſtatim ſequebatur, unde infælix fœmina ita debilitata erat, ut ſex vel ſeptem horis a partu infantis mortuæ expiravit.

In animo etiam, atque etiam volutanti, quomodo fieri poſſet ut in utero conciperet hæc mulier, ad quem membrum Semenve Virile nunquam accederat, mihi in mentem venit opinio doctiſſimi Harvæi noſtri in libro de generatione divulgata (cui ob hanc demonſtrationem aſſentire cogor) viz.

viz. quod fœtus non formatur ex ſemine maſculino in uterum ejecto, ſed tota maſſa Sanguinis (quaſi per contagium) vim plaſticum à Semine virili accipiens ovis uterinis communicat, unde fiunt fertilia, & eo magis cum illo ſentio, quoniam ſcio hanc fœminam Infantulum vehementur appetiiſſe, unde procul dubio eo majori deſiderio cum virorem habuit, & maxime probabile videtur quod inflatis mulieribus inſtante coitus Spiritus eo tunc temporis affatim affluentes effluvia aliquot a ſemine virili attraxerunt, Sanguiniſq; maſſæ & deinceps ovis Uterinis Fœcunditatem communicarunt.

Nota quod non obſtante hac clauſura frequenter per menſes purgata erat antequam utero concepit.

VII. *Account of Books.* 1. Numiſmata, *a Diſcourſe of* Medals, *Ancient and Modern; together with ſome Account of Heads and Effigies of illuſtrious and famous Perſons, in Sculps,* &c. *To which is added, a Digreſſion concerning Phyſiognomy. By* J. Evelin, *Eſq; S. R. S.* Printed for *Benj. Took*, &c. 1697. *in Fol.*

THE Ingenious Author of this Treatiſe, who has ſo often obliged the World with many uſeful Pieces, cultivating and advancing as well Natural Philoſophy as other Parts of Learning and Arts, has in this Diſcourſe given a Learned Account of Ancient and Modern *Medals,* informing the Reader, in his Epiſtle, That having begun this Work about Five Years ſince, he deſiſted from proſecuting it, upon the Publiſhing of Mr. *Walker's*

ker's Treatise upon the same Subject; but finding some Particularities that admitted of a further Improvement, he went on again with his Design; and, after a short Introduction, bewailing the Failure of Marbles, Statues, Trophies, *&c.* in perpetuating memorable Actions, he begins his First Chapter with the *Use* of *Medals*, either made for Money, or to preserve the Memory of Worthy Actions, observing its very early use in the World, and that the First *Roman* Money was Brass, without any Mark at all; then shews the Original of Stamping, which was for a Testimonial of its being of such a Weight. The First *Silver* stamped at *Rome* was a little before the First *Punic* War, and *Gold* not till about Sixty Two Years after, at which time the Worth of Gold to Silver was as 12 $\frac{1}{2}$ to One, though in the earliest times it bore but a decuple Value, among the *Romans* and *Greeks*. Next, coming to speak more particularly of *Medals*, he is of Opinion, That they did not, when first made, pass for Money, but were stampt in Memory of particular famous Actions or Persons. But upon the Inundation of the *Goths*, the Lustre of Medals ended, with all the more Polite Arts. Next he treats of the Materials used for Money, whether Leather, Paper, Earth, Porcelane, Coral, Shells, Linnen, or the like. He in the next Place speaks of the time when the several Metals came first in use, and is inclined to think Iron and Copper were the First, of which he gives several Instances. Then he proceeds to consider the Impressions and Sizes, of which latter there were Three.

The Second Chapter treats of the *Medals* of several Nations, as *Hebraic*, *Punic*, *Barbarous*; those of the *Goths*, *Huns*, *Lombards*, *&c.* with the *British* Coins, where he says, he has seen a Series of all our Coins from *Edward the Confessor*, to our present Times, except *Richard*

chard the Third. Then returning to ſpeak of Medals, he mentions the *Saturnalian* made in Buffoonry, and touches upon ſome of the Cuſtoms uſed at that Feaſt; and obſerves, except thoſe, no Medals were made but upon grave and ſerious Occaſions. Speaking of the Heads and Reverſes, he ſays, Medals without any Reverſe, are never Antique; but may, without Head be good. Our Author next, makes ſeveral Remarks touching the Heads, as whether naked or crowned, bearded or ſhaven, *&c.* as likewiſe of the Figures expreſt at length on the Reverſes: He proceeds to the *Greek* Medals, with their ſeveral Ornaments and Reverſes, thence to the *Barbarous, Parthian, Armenian,* &c. and ſo to our *Saxon*; of all which he deſcribes the particular Ornaments on their Heads, *&c.* then he comes to Medals made of remarkable Perſons, touches upon *Papal* and *French* Medals; after which he mentions the curious Collection of *Pyrrhus Ligorius*, being twenty ſix Volumes of Draughts of *Medals, Inſcriptions, Relievos,* &c. *Greek* and *Roman*; of the Duke of *Savoy's*, Duke *Albert's* of *Bavaria*, now in the Cuſtody of the Royal Society, containing the Images of *Roman* Kings, Conſuls, Dictators, Knights, Tribunes, *&c.* from the Foundation of *Rome* to *Julius Cæſar*; after which he Remarks the Niceneſs of the Ancients, in having their Reſemblances taken by none but exquiſite Maſters, whence we may well believe their Medals to be very like them; he concludes this Chapter, with a Propoſal of deſigning in dead life by a very good Hand, what Medals of undoubted Truth can be procured; and theſe to be as well and exactly Engraven on Copper Plates.

The Third Chapter treats of Ancient and Modern Reverſes, as they relate to Hiſtory, *Chronology*, and other parts of Learning, the uſe and benefit whereof he ſhews

in

in ſeveral particulars, informing us not only in Hiſtory and Chronology, but alſo giving the true Form of ſeveral Habits, Inſtruments, Engines, Machines, Inventions, Atchievements, Cuſtoms, *&c.* of the Ancients, but imperfectly otherwiſe deſcribed, together with the Figure under which they repreſented their Gods and *Genii*, particular Countries, *&c.* with the ſeveral Rewards as Crowns, *&c.* for virtuous and noble Actions: then deploring the want of Medals to illuſtrate our own Hiſtory he gives an Account of all or the moſt that have been ſtamped here from *Edward* the third, through the ſeveral Reigns, to the late Revolution, referring the Reader for thoſe made ſince that time to the late Publiſh'd *Hiſtoire Metallique de Guillaume* III. by *N. Chevalier*, in *fol. Amſterdam*, 1692.

The Fourth Chapter treats of Perſons and Things deſerving the Honour of Medals, tho' moſt of them never obtained it, and in this finds our Nation too deficient, and names ſeveral ingenious Worthies now living.

The Fifth Chapter is of *Inſcriptions* upon Medals, and their ſeveral Forms and Differences, chiefly relating to *Roman* and *Greek* Medals: here he gives us the Notes and Abbreviations of words to be met with in *Roman* Medals.

In the Sixth Chapter he gives Inſtructions for the procuring Antique and rare Medals, with Directions to diſtinguiſh the True from Counterfeits, preſenting a Catalogue of ſome Alphabetically; and in this place ſhews the ſeveral tricks uſed in making the Cheats and Falſe ones, and ſets down ſome ways to take off Medals by a ſort of Glew, and the like.

In the Seventh Chapter our Author Diſcourſes of Mints and the moſt skilful Artiſts, with directions to

Collect

collect and disposse Medals for the Cabinet, and adds some Reflexions on the Modern Clipping and Diminution of Coyn. Here he observes the great number of Mints in one Kingdom formerly, and the excellency of the Method now used in Minting, far beyond the old way of Hammering; and in this place gives his Opinion and Reasons against either debasing the Coyn, or enhancing the Value, and then enumerates the most eminent Masters in this Art: Amongst them he mentions *Trecia* of *Milan*, who Cut the King of *Spain*'s Arms on a Table Diamond; next he gives a Catalogue of Authors treating of this Subject, with some curious Collectors of our own, and other Nations; and then concludes this Chapter with a Catalogue of those Medals that succeeded *Jovianus*, where Mr. *Walker*'s Catalogue ends.

The Eighth Chapter gives an Account of Heads and Effigies in *Taille douce*, with particular Directions for such a Collection; presenting us with a Catalogue of Persons meriting a Place therein, as well Women as Men.

The Ninth Chapter, which concludes the Work, contains a Digression Concerning *Phisiognomy*, where the Author beginning with the Head, goes through all the Features of the Face, and Proportions of the Body and Limbs, giving his Opinions and Conjectures of the Natural Dispositions, Wit, and Qualifications to be gathered from the Observation of each Part and Member particularly; for which, as likewise many other Remarkable pieces of Learning and ingenious Remarks, we refer to the Elaborate Treatise it self.

II. *Caſpari Bartholini Thom. F. Specimen Philoſophiæ Naturalis. Accedit de Fontium, Fluviorumque Origine Diſſertatio Phyſica* Amſtelodam. 1697. 12mo.

THE Deſign of this Piece is to Inſtruct the Youth of *Copenhagen* in the Rudiments of Natural Philoſophy, therefore the *Author* delivers his Elements in a ſhort compendious Method; in which he treats of *Hypotheſes*, of the Underſtanding in General, then proceeds to Principles, as Matter, Form, Motion, Extenſion, Diviſibility, Space, Time, &c. Afterwards he handles particular Qualittes, as Heat, Cold, Fluidity, Solidity, Rarity, Denſity, Light, Colours, Sound, Taſte, Smell, Gravity, Magnetiſm, &c. He Examines the ſeveral Elements and Syſtems of the World, the Earth with all its *ſtrata*, Inequalities, and Foſſils; the Air and Heavens with the Meteors and Celeſtial Bodies. After which he deſcends to the Functions of Animal, and Vegetable Bodies, as Senſation in general, and all the Senſes in particular; Digeſtion, Nutrition, Secretion, Excretion, Reſpiration, Generation, Muſcular Motion, Vegetation, &c.

To theſe the *Dutch* Book-ſeller has annex'd a *Diſſertation* of the *Authors*, publiſhed in 4*to*. about Nine or Ten Years ago, which Diſcourſes upon the Riſe of Springs and Rivers, wherein he firſt deſcribes the internal and external Face of the Earth, with its ſeveral Beds, Layers and Cruſts, (which he derives from the Sediments of the General Flood, as well as of particular Inundations,

dations, the *ſtrata* being of different Textures, compounds, Simples, repeated over and over, which *Steno* firſt moſt accurately diſtinguiſh'd, *Prodrom. Engliſh Edit*, *p.* 39, 40, 41.) The great Inequalities on the Surface, he attributes to the diſruptions and changed Situations of the *Strata*, which gave Birth to the Hills and Fountains.

Amongſt the many Opinions concerning the Origine of Springs, our *Author* only examines three or four, tho' Monſieur *Perault*, in his *Origine des Fontaines*, reckons up above Twenty two; and Dr. *Plot* is very copious in his *Tentam. Philoſoph.* The *Hypotheſes* refuted by *Bartholine*, are 1ſt, thoſe, which attribute the Cauſe of Springs to the Condenſation of Vapours on the Mountains, or in Caverns. Secondly, They who will needs draw them from the Evaporations of ſubterraneous Waters, either lodg'd about the Centre of the Earth, or nearer the Surface, as *Becher* and *Des Cartes*. The Third Conjecture, which our Author undertakes to oppoſe, is that of bringing Springs from the Sea, by Filtration or Canals.

Laſtly, He delivers his own Opinion, which makes Rain-Water, ſtop'd by the *Strata* of the Earth, to be ſufficient for the feeding of Fountains; and this may be Calculated from the Obſervations of M. *Perault*, and *Mariotte*, to which Mr. *Ray* adds many Illuſtrations in his *Three Phyſico-Theological Diſcourſes*, 2d *Edit.* 1693.

ERRATA

ERRATA for *Philosophical Transact.* Numb. 233.

PAge 730. *l.* 27. *read* tamen rectificandi *l.* 30 *selegi.*

In Numb. 236.

Page 6. l. 1. *dele* dry *p.* 8. *l.* 8. dry scorched *p.*10. *l.*16. is often *l.* 21. Cloathes and Flesh *p.*17. line 15. for MCK read NMCK *ibid.*l.21. *for* CR *r.* CK. *ibid.* l.30. *for* Luna *r.* Lunæ *ibid.* l. 31. *for* qui *r.* quæ *ibid.* deleatur L*ult. p.* 18. l. 1. *for* Posito *r.* Et posito *ibid.* l. 45. *add* o. 42 *ibid. let these Figures, viz.* 2. 24. 2. 54. *&* 3. 24. *be comprehended within one Brace ibid.* l. 28. *for* transitus *r.* . Transitus *ibid.* l. *penult. after* borealissimi *add* vel australissimi *p.* 19. l. 16. *for* ipsâ *r.* ipsa *p.* 20. l. 7. & 8. *for* sumpta, ut A T. *r.* sumptam in diagonali ut A T & ducta per T rectâ E T F parallela ipsi A C; ac *ibid.* l. 25. *for* 6h. 29'. 36". *r.* 6h. 20'. 36". *p.* 21. l. 3. *for* 6h. 30' 34" *r.* 6h. 32'. 34". *ibid.* l. 6. *after* jam *add* videtur Eclipsata *p.* 22. l. 4. *for* O—K. *r.* N K *ibid. l.* 30. *for* o. 32. *r.* o 35. *ibid.* l. 32. *for* o. o. *r.* o. 3. *p.* 23. l. 2. *for* 7h. 6'. 46". *r.* 7h. 6'. 40". *ibid.* l. 15. *for* 7h. 29'. 30". *r.* 7h. 19'. 30". *ibid.* l. 24. *for* 7h. 29'. 4". *r.*7h. 26'. 4". *p.* 25. l. 30. *&* 31. *dele* Idem complementum *p.* 27. *under* l. 4. *add* situs Cornuum *ibib. under* l. 24. *add* situs Cornuum *p.*28. l. 5. *for* o' 24". *r.*2' 24" *ibid.* l.30. *for* 9h. 3' 37". *r.* 9h. 3'.38" *ibid.* l. *penult. for* Cleomedes *r.* Finis Maris Crisii.

London: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society; at the Princes Arms in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

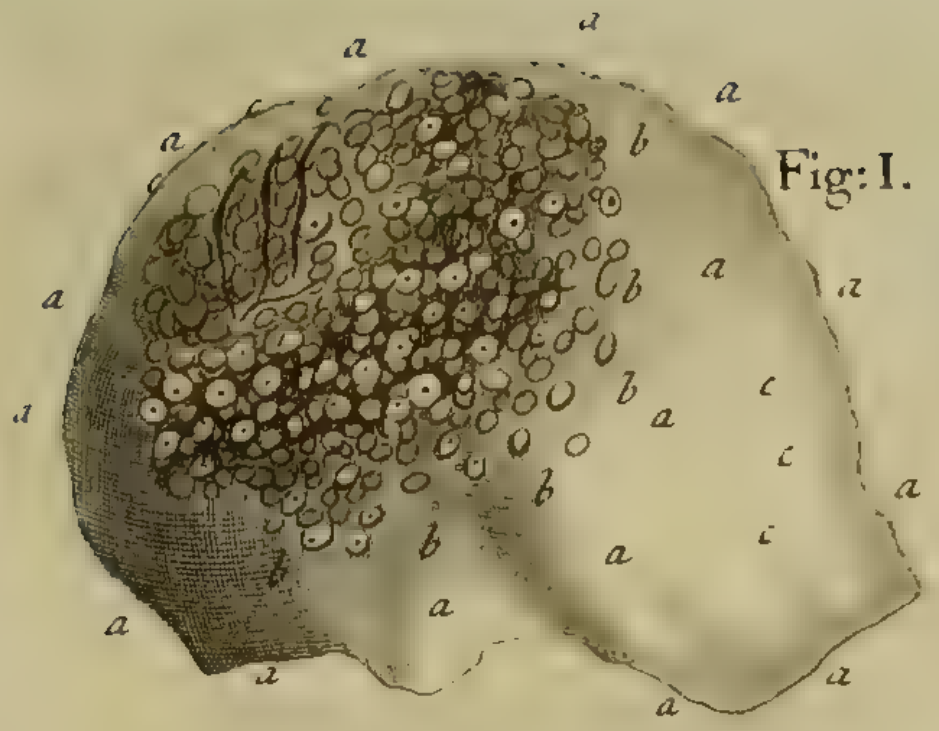


Fig: I.

Fig: II.

Fig: III.

Fig: V.

Fig: IIII.

PHILOSOPHICAL TRANSACTIONS.

For the Month of March, 1698.

The CONTENTS.

I. Historia; & Explicatio figurarum, Embryon quatuor Septimanarum, & placentam cotyledoniformem exhibentium, Autore Philippo Jacobo Hartmanno, Phil. & M. D. *&c.* II. *Of the Use of the Root* Ipecacuanha, *for Looseneſſes, tranſlated from a* French *Paper: With ſome Notes on the ſame, by* Hans Sloane, *M.D.* III. *Account of a Monſtrous Calf with Two Heads. Communicated by the Right Honourable, Sir* Robert Southwell, *V. P. R. S.* IV. *A Queſtion in Muſick lately propoſed to Dr.* Wallis, *concerning the Diviſion of the Monochord, or Section of the Muſical Canon: With his Anſwer to it.* V. *Part of a Letter from Mr.* Ray, *F. R. S. to* Dr. Sloane, *giving an Account of the Poyſonous Qualities of* Hemlock-Water-Drop-Wort. VI. *Several Experiments about giving Variety of Tinctures to Water,* &c. *Communicated to*

the Royal Society by the Right Honourable Sir Rob. Southwell, *V.P.R.S.* VII. *An Account of a very large Eel, lately caught at* Maldon *in* Essex; *with some Considerations about the Generation of Eels, by* Mr. Dale. IX. Account of a Book. *The History of* Poland *in several Letters to Persons of Quality, giving an count of the Ancient and Present* State *of that* Kingdom, Historical, Geographical, Physical, Political *and* Ecclesiastical, *&c. With several Letters relating to Physick.* Vol I. *To which is added a new Map of* Poland. *By* Bern. Connor, *M.D. F.R.S. and Member of the Colledge of Physicians*, &c.

I. *Historia ; & explicatio figurarum, Embryon quatuor Septimanarum, & placentam cotiledoniformen exhibentium, Autore Philippo Jacobo Hartmanno,* Phil. & Med. D. *&c.*

MAtrona quadraginta circiter annorum, *tertium* hunc *abortum* faciebat, anno 1685. *Septemb.* 27. ante quatuor Septimanas ipsi menses adhuc fluxerant, tertio autem qui abortum præcessit die linteis lævigandis operam navans, & cylindris ducendis manum admovet, exin die dicto sanguis grumosus magnâ copiâ erumpere, quum aliàs Uteri hæmorrhagiæ esset obnoxia; successit tandem placenta cum chorio, amnio & fœtu formâ ovi integri; quod ovum citra ullam aliorum contractationem ac palpationem domum auferre licuit, ubi otiosus omnia rimatus sum.

Figura

Figura I.

Placentæ ſtructuræ exterioris, quâ Utero adhæſit, partem Colyledoniformem exhibens.

a a a &c. Magnitudo placentæ, quæ totius Uteri cavitatem implevit.

b b b &c. Pars cotyledoniformis meris glandulis globoſis obſita ; glandulæ in medio rubicunda puncta oſtendunt vaſorum ruptorum ora hiantia : circa puncta ſunt foveolæ quaſi impreſſæ, quas & ſceleton monſtrat : Huic parti colytedoniformi intus oppoſitæ erant veſiculæ rubicundo & flavo liquore diſtentæ, quas figura III. exprimit.

c c c Loca in quibus ſanguinei ductus inſigniter erant conſpicui.

Figura II.

Placentæ Structuræ exterioris, quâ Utero adhæſit, partem alteram exhibens.

A. Locus ex quo vaſa longiora avulſa dependebant ; ubi Placenta Utero firmius annexa aut agglutinata fuit.

B. B. Laciniæ Placentæ gracileſcentis.

C. Foramen per quod Chorion & amnion prominebant.

D. D. &c. Placentæ globus quem omnes figuræ repreſentant, ut totius Uteri cavitatem à Placenta ſuccinctam fuiſſe, fœtumque in eadem tanquam in altero Utero ſive Utriculo contineri conſtet.

Figura III.

Placentæ Structuræ interioris pars prior cum Embryo.

1. Veſicula inſignior ſanguine rubicundo turgida.

2. Veſicula alia flavo liquore repleta.

3. Veſicula maxima ibidem flavo liquore diſtenta.

4. 4. 4. 4. Veſiculæ circum ſitæ minores, variâ proportione, varioque liquore, rubicundo, flavo, limpido, plenæ.

5. Umbilicalis funiculus cum vaſis.

6. Embryon ; figuræ, magnitudinis, manuum & pedum

dum ſitûs, penis, podicis caudati, foraminis ani quaſi à meconii nigrore punctati, helices auriculæ, rectûs oris, accuratâ omnium delineatione.

7. Locus in quo funiculi tunica veſicularum latebris ſe inſinuabat.

8.8.8. *&c.* Spatium veſiculis vacuum, chorio & amnio Placentæ crepidinibus annexis.

Figura IV.

Placentæ Structuræ interioris pars altera ſine Embryo.

1.1.1. Veſicutæ variâ magnitudine, varioque in eis liquorum colore.

2. Vaſa ſanguinea hinc inde commeantia.

3.3.3. *&c.* Spatium Veſiculis vacuum, Placentæ expanſionem cum annexa Chorii tunica oſtendens.

4.4.4. Lacinia Chorii cum Placentæ divulſæ parte graciliori.

5. Foramen à Placentæ & Chorii ruptura.

Figura V.

Embryon exhibens.

A. Embryi Corporis habitudo.

1. Linea alba frontem dividens.

2. 3. Duæ aliæ lineæ albæ ad ſuturam coronalem tendentes.

4. Duo puncta quæ narium foramina deſignant.

5. Helix auriculæ albicante lineâ diſcreta.

6. Penis.

7. Pedum digiti inequaliter deſinentes, cum exiguis lineis fiſſurarum indicibus; eadem ratio manuum.

8. Caudæ eminentia cum punctato ani foramine.

9. Oris rictus.

10. Medulla ſpinalis albicans utrinque à ſe verſus latera exiles lineas albas, æqualiter curtas, dimittens.

11. Umbilicalis funiculus per cujus tunicam exilia vaſa tranſparent.

II. *Of the Uſe of the Root* Ipecacuanha, *for Looſeneſſes, tranſlated from a* French *Paper: With ſome Notes on the ſame, by* Hans Sloane, *M. D.*

WHEN the Remedies commonly uſed in the Practice of Phyſick, have not been able to cure Dyſenteries, and obſtinate Looſeneſſes, the moſt famous Phyſitians have in all times been obliged to leave them to Nature, which, in ſuch Caſes, ſeldom ends favourably for the Patient.

This has made me think, that I ſhall do a thing acceptable, not only to my Brethren, who may have us'd the ordinary Methods; but alſo to the Sick, who have not been able to recover their Health by general Remedies: I will diſcover to them an infallible Medicine for curing ſuch Diſtempers, how dangerous and inveterate ſoever the Diſtemper may be, without fear of any dangerous Accident to follow.

Yet I am obliged to except from the Number of the Sick, who may expect Relief by this ſo uſeful Method, which I here promiſe, ſuch as are diſeaſed in their Lungs under Decays, Hydropick Perſons, becauſe the Flux which comes upon them is a Sign of an Extinction of the Natural Heat, and approaching Death: all that can be expected from my Remedies is, to prolong Life for ſome time: But I do not promiſe them a perfect Cure.

I muſt alſo give them Notice, that by the length of the Diſeaſe, they will be diſordered in their Head, have a Hiccup and a Vomiting, with a Pain in the lower Belly, accompanied with Stools reſembling the Dregs of Wine, or the Waſhings of Meat, ſmelling like Carrion, and it will be better to let them alone, for theſe are ſure

Marks that the Gangreen is already in their Bowels.

As for all others ſick of a Dyſentery, they need but to obſerve the following Rules, and they will be cured eaſily: Firſt, they muſt take for Three Days together, Morning and Evening, one of the Papers of Powder marked with A, diluted with half a Glaſs of Wine, and as much Water, to diſpoſe them by Degrees for Purging, and to ſweeten and correct the ſharp corroſive Humours, which are of the Nature of *Aqua Fortis*, and the Spirit of Nitre, and which eat away the Tunicles of the Inteſtines, and the Mouths of the Veſſels, from whence it comes to paſs, that from a ſingle Looſeneſs they often fall into a Dyſentery, becauſe thoſe depraved Humours become ſharp and corroſive, and the Malady augments every Day; ſo that to make a ſure Cure, we muſt begin by deſtroying the Sharpneſs and Malignity of thoſe Humours, which is done by this Firſt Remedy.

℞ *Antim Diaph. Crabs Eyes*, of each *gr.* x. *Croc Martis*, *gr.* viii. *Mace*, *gr.* iv. He muſt eat ſmall Broath Two Hours after, or a Cruſt of Bread dipt in it, or a Freſh Egg in Faſhion of an *Ammulet*, and Dine Lightly; if they find they have need of Nouriſhment, after Dinner they may eat a Toaſt and Wine and Sugar, or a little Biſket ſteept in Water or Wine. At Night they may take another Paper markt A, as before, and Sup lightly.

The Fourth Day they muſt take the Doſe markt

B. ℞ Of good *Ipecacuanha*, well pulveris'd, ℈i. with ℥vj. of *Cimamon* diluted in ſmall Broth, or in half a Glaſs of Wine, to clear the Stomach of a viſcid Bile, that weakens the Natural Heat, and hinders the Digeſtion of the Food; ſo that the Chyle growing ſower, inſtead of growing better, does change all the Maſs of the Blood, and trouble the whole OEcconomy of the Body, which produces all the Accidents which ordinarily accompany this Diſeaſe, they ſhall take, Four Hours after, ſome Broth,

and

and the remainder of the Day eat ſparingly, the Day after they ſhall take Two Papers markt A, as before.

The Seventh Day they ſhall take the Medicine markt C. ℞ Good *Rubarb*, ℈ij. *Ipecacuanha gr.* xv. pulverize them well, and mix them in a Glaſs of *Ptiſan*, D. deſcribed hereafter. This Medicine will take away part of the Obſtructions; they ſhall take, Two Hours after, Broth.

The Ninth Day they ſhall take the Doſe markt B 2. ℞ Good *Ipecacuanha* ℈ij. with *Cinamon gr.* vj. well pulveris'd, and mixt with Broth or Wine.

The Eleventh Day they muſt take a Second Medicine markt C. and obſerve the ſame Regimen as at Firſt.

On the Thirteenth they muſt take the Doſe markt B. 3. ℞ Good *Ipecacuanha* ℈j. half a ʒ Cinamon with vj. *gr.* of Nutmeg, and obſerve the ſame Diet as on the Two others.

On the Fifteenth they ſhall take the Doſe markt B. 4. ℞ Good *Ipecacuanha* ℈j. with Nutmeg *gr.* x. well pulveris'd. They muſt keep themſelves as on the Three former Days.

Tho' by this Time they find themſelves cur'd, yet they muſt take Care, that they ſuffer not Cold in their Feet, nor elſewhere, while the Diſtemper continues; and they muſt yet obſerve as ſtrict a Diet as if they were ſick, without Faſting or Drinking iced Drinks. They muſt Purge once in Fifteen Days with the Medicine markt C. by which means they will infallibly prevent a Relapſe, by freeing Nature of the Weight that oppreſſes it.

The Days that are not markt before for taking any Remedy, as the 8th, 10, 12, they ſhall take in the Morning and Evening one of the Packets, markt A, as before.

If the Sick has no reſt in the Night Time, becauſe of great Pains, or too frequent Stools, 'tis convenient to take a Spoonful, or one and a half of the Syrup of Coral,

according to the Violence of the Diſtemper, mixt with a Glaſs of *Ptiſan.*

This Syrup will allay the Fermentations, and the Boylings of the Humours, and procure ſleep, which repairing the Force of Nature, will give the Remedies Liberty to act more effectually.

We muſt alſo take a Spoonful of that Syrup at the Evening of that Day, in which they have taken the Remedy B, or C.

All theſe Remedies markt before, muſt be taken in the Morning Faſting, and Two Hours before Supper. Thoſe who do not love to take them mix'd with Liquor, may take them in a Wafer, drinking after them.

'Tis to be remark'd, that one muſt, as much as he can, hinder himſelf from vomiting. If any of theſe Remedies cauſe Vomiting, as it happens ſome times, one muſt not be diſcouraged, for he ſhall not fail to be cur'd, notwithſtanding, becauſe theſe Remedies act briskly on the Cauſe of the Diſtemper, only he muſt take to drink after his vomiting, Three or Four Glaſſes of warm Water, that he may vomit with leſs Pain.

Children, delicate Perſons, and Women with Child, ſhall uſe it in the following Manner:

For Children that are yet Sucking, or are under Three Years Old, they muſt take but the Eighth Part of the Doſes of the Remedies. Children from Three Years Old to Ten, ſhall take a Fourth Part: From Ten to Fifteen, a Third, from Fifteen to Twenty, the Half: The ſame Doſe will ſerve for tender Perſons, and ſuch as are Aged, and Women Big with Child. As for robuſt Perſons, from Twenty to Sixty, nothing ſhall be diminiſh'd from the Doſes above markt.

All Perſons, who by reaſon of their tender Conſtitution, the Weakneſs of their Age or big Bellies are forbid the whole Doſe, ſhall uſe the Remedies a ſecond time,

in

in the manner I have now preſcribed, if the firſt Doſe do not cure them; and by this Means may be aſſur'd of recovering a more perfect State of Health than ever they had.

In many Occaſions, when the Dyſentery is accompanied with a Fever, that the Evacuations of Blood are extraordinary, or the Pains exceſſive, the Patient may be blooded once or twice, if the Strength of the Patient allow it, to empty the Veſſels, to calm the Pain of the Fever, and ſtop the impetuous Motion of the Blood; after which, the Remedies may be continued. In this Caſe, I would adviſe to take, before all things, the Packet B. 4. which before is ordered for the Fifteenth Day; to take away that Fulneſs, which is ſometimes ſo great, that there is Danger in delaying it; after which the Patient ſhall return to the Doſe markt for the firſt Day, and ſo for the reſt; on the Fifteenth the Patient ſhall reſt.

After all theſe Remedies are uſed, the Party ſhall take for Fifteen Days, a ſpoonful of the *Stomachick Elixir*, pure, or in Four Spoonfuls of Water; 'tis made after the following Method:

The Stomachick Elixir.

℞ Of Red Saunder, of *Lignum Aloes*, each half an Ounce, Cinamon two Ounces, of little Cardamoms, Galangall Cloves, Zedoary, each an Ounce; of Anis-ſeed, Fennel and Kermes, each two Drachms; of Liquoriſh, two Ounces, of Caſhu, of Chryſtal Mineral, of each one Ounce; of Raiſins four Ounces; Dates, ten or Twelve, cut the Dates and the Raiſins into little bits, and having beaten that which ought to be beaten, put all into a Matras, and pour upon them a Quart of Brandy, in which the Chryſtal Mineral ſhall be diſſolved; infuſe them a whole Night, and the next Day add two Pound

of

of *Aquæ vitæ*, and let all infuſe in the Cold for four Days, ſhaking the Glaſs four or five times a Day, then filter the Liquor and diſſolve a Pound of fine Sugar in the Elixir, which is thus compleat.

Its Effect is, to fortify the Brain, the Heart, and all the Noble Parts, weakened by the Diſſipation of the Spirits; to fortify the Stomach, and correct the Crudities, and diſſipate the Wind and Swellings thereof, which are common Accidents of this Diſtemper.

One muſt, during the Courſe of the Diſeaſe, eat little, and ſhun what is of hard Digeſtion, and hardly diſtributed, or eaſily corrupted, as Paſty, Beef *a la Mode*, Pork, either ſalt or Freſh Meats: and eat things of good Nouriſhment, ſuch as are Broth made of a Piece of Beef, of the Bloody End of a piece of Mutton, or a Partridge, or an old Cock, whoſe Bones have been broke, and that without Herbs; inſtead of which, one may take Two or Three white Onions, with as many Cloves in them, refraining boild Meats, when one can have other Nouriſhment, till he feel himſelf perfectly well, becauſe they load the Stomach, and eat to Dinner and Supper roaſt Meats, tender and nouriſhing, that are not larded, chewing the Meat well beforehand; to drink at his Repaſts old Wine and Water, and take for his ordinary Drink the *Ptiſan* after markt.

Above all things, the Patient ought to keep himſelf in a quiet frame of Spirit, that he ſuffer not himſelf to be tranſported by any Violence of Paſſion, the leaſt of which is able to raiſe a new Ebullition of the Blood, and to trouble the Humours.

If

If the Patient be not Rich, and cannot go to the Expence of these Aliments we have mention'd, he may make Broths as he is able, or Milk Meats or Food with Water, as it shall most agree with his Palate, with many fresh Eggs; this sort of Nourishment will cover the affected Part, and will defend it and preserve it against the Sharpness of the Humours.

'Tis ordinary for the diseas'd to believe that their Dysenteries comes from Heat; to allay which imaginary Heat, they use Water, Chicken Broth, or Whey, which often proves mortal to the Patient: Therefore 'tis necessary to give Notice, That 'tis very necessary for them to forbear much drinking undiscreetly to quench their Thirst; for the Heat and Thirst which they feel, are only Symptoms and Accidents of their Distempers, and not the Cause, they ought therefore to be more moderate in drinking than ordinary, seeing nothing hurts them more than Excess of Drinking, which weakens the Stomach, and Stifles the Natural Heat: 'Tis therefore convenient, only to gargle the Mouth with Water sugar'd, or to keep some little Verjuice in their Mouths, that may keep them from being Thirsty; but if he drink, it must not be till one Hour after Meals. Seeing it may fall out that some are enfeebled and emaciated by the length of the Disease, it will be convenient in the Intervals to give them Clysters made of Broth, which will serve to maintain them, and to bring them more quickly to their Strength. After the use of the Remedies, they may, to keep themselves in a good Habit of Body, take Goats or Cows Milk, with a little Chocolate, which we leave to the Judgment of the Physician, putting always to it, a litle grated Nutmeg, and Four or Five Grains of Salt in the Milk, that it may not curdle so soon.

The Ordinary Ptiſan.

℞ Of Red Saunders, the Rind of the Pomgranate ā ʒj Tormentil Roots ʒs. Wild Succory and Dandelion ā ʒij. *choice Sumach* ʒij. Leaves of Agrimony, Two Pugils.

Make all boyl over a clear Fire, in ſix pints of Water, which ought to be boyl'd to one half; at the End of the Decoction, as you take it off the Fire, add to it two Drachms of Cinnamon, and as much Powder of Liquorice.

If one be in a place where all theſe Things cannot be had, he may uſe a Decoction of Dandelion in Smith's Water, with a little Cinnamon; if the Pains which accompany the Flux, continue while he uſes the Remedies that ſerve for Purgation, he ſhall take, as there is need, Clyſters made after this manner:

Clyſters.

℞ Shepherds Purſe two Handfuls, Linſeed ʒs. Red Roſes two Drachms, Salt a Handful.

Make all boyl in a Decoction of Barly, ſtrain it, and mix with it the Yolk of a freſh Egg, and two Ounces of Honey of Roſes. Theſe Clyſters will, in a great meaſure take off the Pains of the Guts. If the Pains be very violent, one may add two Heads of white Poppy: But care muſt be taken not to miſtake the Pains of the Guts for the Pains of the Fundament, which may be opened by the Hemorrhoids; to appeaſe theſe Pains one may uſe Juniper-Oyl, drawn by a Retort in an open Fire, from which the Spirit is ſeparated by the Tunnel. If the Hæmorrhoids be outward, you muſt rub them with this Oyl with a Feather,

Feather, every fourth Hour; or if they be internal, one muſt Siringe it with a quarter of a Spoonful of this Oyl, the Pain will ceaſe in leſs than Two Hours, and the Hemorrhoids will wither away, without having need of applying any other Medicine. This was Communicated to me by Mr. *Gaſelier*, one of the beſt Artiſts of his Time, of whom it may be ſaid, as a ſufficient Mark of Honour, that M. *Colbert* (who did, with ſo much Judgment, take notice of every one's Merit) imployed him for his Surgeon, and had him highly in eſteem.

I make an end by telling, that there are a geat many, who cannot be perſuaded, that there are any General Remedies; Theſe will not give greater Credit to this, than others that have not good Succeſs. I own it to be hard enough to underſtand, how the ſame Remedy hath an equal Force on Patients of different Temperaments, in different Conditions, attackt by Diſeaſes of different Kinds, and which do not always come from the ſame Cauſes.

But if no Body, at preſent, diſputes the Vertue of *Quinquina*, and if that Medicine is received as Univerſal by all Phyſicians, it ought not to appear ſo extraordinary, if there be found other Specificks, that equal this in its extent, which are as Sovereign in all ſorts of Fluxes of the Belly, as this is for all Intermittent Fevers. 'Tis true, that the Help which this gives, does excel the *Quinquina*, that they cure without Relapſe. But as nothing but Experience can make known the Truth, the beſt way is to keep ones ſelf free from Prejudices, and to ſuſpend his Judgment till the Event ſhew what we may believe of it.

It is convenient, to tell thoſe who fear to take theſe Remedies by the Mouth, that they may be cured by an outward Application, the Uſe of which, I ought to keep to my ſelf, to give to every Patient in particular, that

demands it. I must also give you notice, that some Persons have counterfeited the Remedies which I have given for the Bloody Flux, but the Success has not been answerable to their Pretences, therefore Men must be on their guard, and not suffer themselves to be abus'd; for I assure you, that I have communicated my Secret to none but his Majesty.

Some Notes on this Paper, by Hans Sloane, *M. D.*

ALtho' I am of Opinion that the Root mentioned in the foregoing Paper, is not so infallible a Remedy for Fluxes, as is pretended; yet considering that sometimes those Distempers yield not to ordinary Means, and that this has a great Reputation in our Neighbour Nations, and may be had in this, I thought it might be beneficial to the Publick, to have it (which was communicated to me by Dr. *Charles Preston*) Printed in *English*, that it may be considered of, and brought into use, if by proper Judges of the Circumstances of the Sick, it may be thought Harmless and Helpful.

In order to a fuller Understanding of it, I think it necessary to take notice, that *Piso*, in his Edit. 1648. *p.* 101. 1658. *p.* 231. *Pomet. p.* 46. *Marcgrave, p.* 16. and an Author at the End of Dr. *Lister's Exercitations* lately Printed abroad, have treated of this Herb. It seems to have been first taken Notice of by an Anonymous *Portugal*, who lived in *Brasile* (supposed to be one *Manoel Tristaon*) whose Book falling into the Hands of the *English*, is Translated and Published by *Purchas*, in the Year 1625. In whose *Pilgrims*, *Vol.* 4. *Lib.* 7. *Cap.* 1. § 5. *p.* 1311. he speaks of an Herb called in *Brasile*, *Igpecaya*, or *Pigaya*, which I verily believe to be this.

Igpecaya,

Igpecaya, or *Pigaya*, ſays he, is profitable for the Bloody Flux, the Stalk is a quarter long, and the Roots of another, or more, it hath only four or five Leaves, it ſmelleth much whereſoever it is, but the ſmell is ſtrong and terrible, this Root beaten, and put in Water all Night at the Dew, and in the Morning, if this Water with the ſame Root beaten and ſtrained be drunk, only the Water, it cauſeth preſently to Purge in ſuch ſort, that the Laske ceaſeth altogether.

Moſt of this is Tranſlated into Latin from *Purchas*, by *Jo.de Laet*, *Amer.Lib.*15.*Cap.*10. *p.*566. from the Hint of whom, I ſuppoſe *Piſo* and *Marcgrave* inquired more after it in *Braſile*; from whoſe Inquiries, I conjecture, we may have ſo good an Account as they give us.

III. *Account of a Monſtrous Calf with Two Heads. Communicated by the Right Honourable, Sir* Robert Southwell, *V. P. R. S.*

A Cow of Mr. *Arthur Dabs*'s, a ſubſtantial Free-holder of *Wilnecot*, in the County of *Warwick*, did on *Monday* the 11th of *January*, 169$\frac{7}{8}$. bring forth a Monſtrous Calf, having one perfect large Head, and on the Right Side of that, grew another almoſt as large, and and of true Shape, having both Tongue and Teeth; and from the Roof of the Mouth of the Monſtrous Head, hung down a Piece of Fleſh with the Shape of a Tongue upon it, and a Row of Teeth, as on an under Jaw, which occaſioned the Man who ſhew'd it, to ſay, it had Three Mouths. It had to each Head Two Eyes, only thoſe of the Monſtrous were very ſmall, and I believe had no Sight. It had only Two Ears to both Heads, one of

which was placed on the far Side of the Monſtrous Head, the other as uſual in other Calfs. It breathed equally at both Mouths, and had Communication with the ſame Throat, but took its Nouriſhment only at the perfect Mouth: The under Jaw of the other being ſo weak, that the Mouth always ſtood open and drivell'd. It appeared on the Left ſide to be a perfect Calf, and look'd very lively, and was, at Three Days Old, as large and ſtrong as other Calfs uſually are at Ten Days or a Fortnight.

IV. *A Queſtion in Muſick, lately propoſed to Dr.* Wallis, *concerning the Diviſion of the Monochord, or Section of the Muſical Canon: With his Anſwer to it.*

Queſtion.

TAKE a String of any Muſical Inſtrument, and divide the ſame into two equal Parts, and ſtop the String there; it ſhall be an Eighth, which conſiſts of twelve Semi-tones.

Hence it appears, that the Frets are nearer to one another toward the Bridge, and wider toward the Nut or Head of a Viol. And that they decreaſe or proceed in a Geometrical Proportion.

Quære, How is it poſſible, from the foreſaid Hypotheſis, to divide the other 11 Semi-tones, in their due Proportion, and to demonſtrate the ſame. And whether the other Diſtances aſſigned by *Simpſon* in his *Compendium of Muſick* (and Chapter of Greater and leſſer Semi-tones) are demonſtrable from the ſaid Hypotheſis.

Anſwer.

Answer. *March* 5. 169⅞.

WHAT Method is used by *Simson* (in the Book mentioned) to divide a String or *Chord*, I know not: Nor have I the Book at Hand to consult.

That a String *open* (or at its full Length) will sound (what we call) an Octave (or *Diapason*) to that of the same String *stopped in the Middle* (or at half its Length) is very true. And hence it is that we commonly assign, to an Octave, the *Duple* Proportion (or that of 2 to 1:) because such is the Proportion of Lengths (taken in the same String) which give those Sounds.

And (upon a like Account) we assign to a Fifth (or *Diapente*) the *Sesqui-alter* Proportion (or that of 3 to 2:) And, to a Fourth (or *Dia-tesseron*) the *Sesquitertian* (or that of 4 to 3:) And to a *Tone* (which is the Difference of a Fourth and Fifth) The *Sesqui-octave* (or that of 9 to 8:) Because Lengths (taken in the same String) in these Proportions, do give such Sounds.

And (universally) whatever Proportion of Lengths (taken in the same String, equally stretched) do give such and such sounds; such Proportions (of Gravity) we assign to the Sounds so given.

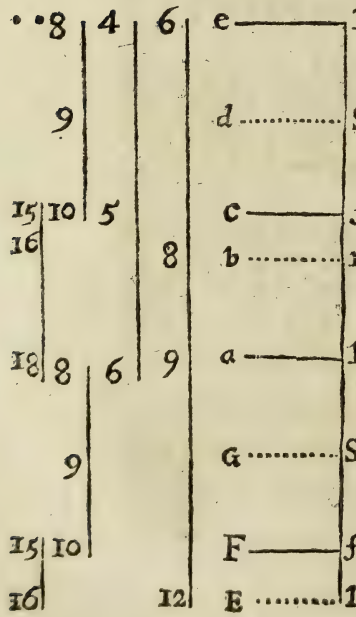
But when an Eighth (or Octave) is said (in common Speech) to consist of 12 Hemi-tones, or 6 Tones; this is not to be understood according to the utmost Rigour of Mathematical Exactness, (of such 6 Tones, as what they call the *Diazeuctick Tone*, or that of *la mi*, which is the Difference of a Fourth and Fifth;) but, as exact enough for common Use. For Six such Tones (that is, the Proportion of 9 to 8 Six Times repeated) is somewhat *more* than that of an Octave (or the Proportion of 2 to 1:) And, consequently, such an *Hemi-tone*, is somewhat *more* than the Twelfth Part of an Eighth, or Octave, or *Dia-pason*. But the Difference is so little, that the Ear can hardly distinguish it: And therefore (in common Speech) it is usual so to speak.

And, accordingly, when we are directed to take the Lengths (for what are called the 12 *Hemi-tones*) in Geometrical Proportion: it is to be understood (not, to be so in the utmost Strictness, but) to be accurate enough for common Use; for placing

placing the Frets on the Neck of a Viol, or other Musical Instrument; wherein a greater Exactness is thought not necessary. And this is very convenient, because (thus) the Change of the Key (upon altering the Seat of *mi*) gives no new Trouble, for this doth indifferently serve any Key; and the Difference is so small, as not to offend the Ear.

But those who choose to treat of it with more exactness, go this way to work.

Presupposing the Proportion for an Octave (or *Dia-pason*) to be that of 2 to 1; they divide this into Two Proportions; not just *equal* (for that would fall upon *surd* Numbers, as of $\sqrt{2}$ to 1;) but *near-equal* (so as to be expressed in small Numbers.) In order to which, instead of taking 2 to 1, they take (the double of these Numbers) 4 to 2; (which is the same Proportion as before;) and interpose the middle Number 3. And, of these Three Numbers, 4, 3, 2, that of 4 to 3, is the Proportion for a Fourth (or *Dia-tessaron.*) And that of 3 to 2, the Proportion for a Fifth (or *Dia-pente.*) And these Two put together, make up that of an Octave (or *Diapason,*) that of 4 to 2, (or 2 to 1.) And the Difference of those Two, that of a *Tone* or 9 to 8. As will plainly appear in the ordinary Method of Multiplying and Dividing Fractions. That is, $\frac{4}{3} \times \frac{3}{2} = \frac{4}{2} = \frac{2}{1}$. And $\frac{4}{3}) \frac{3}{2} (\frac{8}{9}$.



Thus, in the common Scale (or *Gam-ut*) taking an Octave, in these Notes, *la, fa sol la, mi, fa sol la*; suppose, from *E* to *e*, (placing *mi*, in b *fa* ♭ *mi*; which is called the *Natural Scale*;) the Lengths for the Extremes *la la*, an Octave, are as 2 to 1, or 12 to 6. Those for *la la* (in *la fa sol la*) or *mi la* (in *mi fa sol la*) a Fourth, as 4 to 3, or 12 to 9, or 8 to 6. Those for *la mi* (in *la fa sol la mi*) or *la la* (in *la mi fa sol la*) a Fifth, as 3 to 2, or 12 to 8, or 9 to 6. Those for *la mi*, the *Diazeuctick-Tone* (or difference of a Fourth and Fifth,) as 9 to 8. So have we for those Four Notes *la la mi la*, their Proportionate Length in the Numbers 12 9 8 6.

Then

Then, if we proceed in like manner, to divide a Fifth (or *Dia-pente*) *la fa ſol la mi*, or *la mi fa ſol la*, or the Proportion of 3 to 2, into *near-equals*, (taking double Numbers in the ſame Proportion, 6 4; and interpoſing the middle Number 5;) of theſe Three Numbers, 6 5 4; that of 6 to 5, is the Proportion of a leſſer Third (called a *Tri-hemitone*, or Tone and half,) as *la fa* (in *la mi fa.*) And that of 5 to 4, is the Proportion of the Greater Third (commonly called a *Ditone*, or Two Tones,) as *fa la* (in *fa ſol la*) which Two put together, make a Fifth, as 3 to 2; That is $\frac{6}{5} \times \frac{5}{4} = \frac{6}{4} = \frac{3}{2}$. And their difference is as 25 to 24: That is $\frac{6}{5}) \frac{5}{4} (\frac{25}{24}$. So have we for theſe 3 Notes *la fa la*, their proportionate Lengths in Numbers, as 6 5 4.

In like manner, if we divide a *Ditone* (or Greater Third) as *fa la* (in *fa ſol la*) whoſe Proportion is as 5 to 4 (or 10 to 8) into Two *near-equals* (by help of a middle Number 9;) then have we (in theſe Three Numbers 10 9 8) that of 10 to 9, for (what they call) the *Leſſer Tone*: And that of 9 to 8, for (what they call) the *Greater Tone*.

But, whether *fa ſol* ſhall be made the *Leſſer* (as 10 to 9) and *ſol la* the *Greater*, as 9 to 8;) or, This the *Leſſer* (as 10 to 9) and That the *Greater* (as 9 to 8) or ſometime This and ſometime That, as there is occaſion, (to avoid what they call a *Schiſm*;) is ſomewhat indifferent: For, either way, the Compound will be, as 5 to 4; and the Difference (which they call a *Comma*) as 81 to 80. That is, $\frac{9}{8} \times \frac{10}{9} = \frac{10}{9} \times \frac{9}{8} = \frac{10}{8} = \frac{5}{4}$. And $\frac{10}{9}) \frac{9}{8} (\frac{81}{80}$.

Laſtly, If from that of the *Tri-hemitone* (or Leſſer Third) *la mi fa*; whoſe Proportion is as 6 to 5; we take that of the Tone *la mi* (which is the Difference of a Fourth and Fifth) as 9 to 8; There remains for the Hemi-tone *mi fa* (or *la fa*) that of 16 to 15. That is $\frac{9}{8}) \frac{6}{5} (\frac{48}{45} = \frac{16}{15}$.

Or, the *Tri-hemitone* (or Leſſer Third) whoſe Proportion is as 6 to 5; may be divided into Three *Near equals*, (by taking Triple Numbers, in the ſame Proportion, 18 15; and interpoſing the Two Intermediates, 17 16;) which will therefore be as 18 to 17, and as 17 to 16, and as 16 to 15; That is, $\frac{18}{17} \times \frac{17}{16} \times \frac{16}{15} = \frac{18}{15} = \frac{6}{5}$.

Where alſo the *Greater Tone*, who's Proportion is as 9 to 8, or 18 to 16, is divided into its Two *Near-equals* (commonly called *Hemi-tones*,) that of 18 to 17, and that of 17 to 16: That is, $\frac{18}{17} \times \frac{17}{16} = \frac{18}{16} = \frac{9}{8}$. And

And the *Leſſer Tone*, that of 10 to 9, or 20 to 18, may be in like manner divided into that of 20 to 19, and that of 19 to 18: That is, $\frac{20}{18} \times \frac{19}{18} = \frac{20}{18} = \frac{10}{9}$.

Which Diviſions of the *Greater* and *Leſſer* Tone, anſwer to what is wont to be deſigned by *Flats* and *Sharps*.

So that (by this Computation,) of theſe Eight Notes, *la, fa ſol la, mi, fa ſol la*; their Proportions ſtand thus; that of *la fa* (or *mi fa*) is as 16 to 15. That of *fa ſol* as 10 to 9, and that of *ſol la* as 9 to 8: (or elſe that of *fa ſol* as 9 to 8, and that of *ſol la* as 10 to 9,) That of *la mi* as 9 to 8. And if either of the Tones (Greater or Leſſer) chance to be divided (by Flats or Sharps) into (what they call) Hemi-tones, their Proportions are to be ſuch as is already mentioned.

There may be a like Diviſion of a Fourth (or *Dia-teſſaron*) into Two *Near equals*: And of ſome others of theſe, into Three *Near-equals*. Which might be of uſe for (what they were wont to call) the *Chromatick* and *Enarmonick* Muſick. But thoſe Sorts of Muſick, having been long ſince laid aſide, there is now no need of theſe Diviſions, as to the Muſick now in uſe.

V. *Part of a Letter from* Mr. Ray, *F. R. S. to* Dr. Sloane, *giving an Account of the Poyſonous Qualities of* Hemlock-Water-Drop-Wort.

I Shall now communicate to you, a Story or Two of the direful Effects of *Oenanthe aquatica, Cicutæ facie ſucco Viroſo* of *Lobel*, which we may Engliſh *Hemlock-Water-Dropwort*, upon ſeveral Perſons that eat of the Roots of it, ſent me not long ſince in a Letter from Dr. *Francis Vaughan*, a Learned Phyſitian in *Ireland*, living at *Clonmell*, in the County of *Tipperary*. This Gentleman obſerving me, notwithſtanding what Dr. *Johnſon* in his *Gerardus emaculatus*, and *Lobel* in his *Adverſaria*

faria had written of the venenoſe Quality of this Plant, to be ſomewhat doubtful of it in my *Synopſis Methodica Stirpium Britannicarum*, for my full Satisfaction and Conviction, wrote the following Abſtract of a Hiſtory drawn up by a Perſon, who is at preſent his Brother-in-law, concerning the Effects of it upon himſelf, and Seven other Young Men, who ignorantly miſtaking it for *Sium aquaticum*, or *Apium Paluſtre*, did eat of it.

Eight Young Lads went one Afternoon a fiſhing to a Brook in this Country, and there meeting with a great Parcel of *Oenanthe Aquatica ſucco viroſo*, (in Iriſh *Tahow*) they miſtook the Roots of it for *Sium aquaticum* Roots, and did eat a great deal of them. About four or Five Hours after going home, the Eldeſt of them, who was almoſt of Man's Stature, without the leaſt previous appearing Diſorder or Complaint, on a ſudden fell down backwards, and lay kicking and ſprawling on the Ground, his Countenance ſoon turned very Ghaſtly, and he foamed at the Mouth. Soon after Four more were ſeized the ſame way, and they all died before Morning, not one of them having ſpoken a Word from the Moment in which the venenate Particles ſurpriſed the *Genus Nervoſum*. Of the other Three One ran ſtark Mad, but came to his right Reaſon again the next Morning. Another had his Hair and Nails faln off, and the Third (who is my Brother-in-law) alone eſcaped without receiving any Harm: Whether he eat leſs of this fatal Root, or whether his Conſtitution, which is to this Day very Athletick, occaſioned it, I cannot tell. Though I am of Opinion, that his ſpeedy running above Two Miles Home, after that he ſaw the firſt Young Man fall, together with his Drinking a very large Draught of Milk, warm from the Cow in his Mid-way, were of ſingular uſe to him. For his Violent Sweating did doubtleſs expel and carry off many of the venenoſe Particles, and had a better Effect

than perhaps, the beſt of our Alexipharmicks (which you know are generally Diaphoretick) might have produced in this Caſe. Beſides, I believe the Draught of warm Milk did act its part, by involving the Acid or Acrimonious Poiſonous Particles, and rendring them unactive, and preventing their ſeizing the *Genus Nervoſum*, till they were expelled *per Diaphoreſin*. But this is but my Conjecture, which I willingly ſubmit to more mature Judgments. This happened about Thirty Years ago; but there are many yet alive, who aſſert the Truth of it, having been Eye witneſſes of this dreadful Tragedy. There was alſo a Dutch-man, about Two Years ſince, within Eight Miles of this Place, Poyſoned by boyling and eating the Tops of this Plant, ſhred into his Pottage; he was ſoon after found dead in his Boat, and his little Iriſh Boy gave Account of the Cauſe of his Death, to be eating this Herb, which he forewarned his Maſter againſt, but in vain, the Dutch-man aſſerting, that it was good Sallade in his Country; ſo that I believe he took it for *Apium Paluſtre*, which its Leaves much reſemble. Thus far Dr. *Vaughan*.

Several Parallel and no leſs Tragical Hiſtories of later Date, of the miſerable Deſtruction of divers Perſons, by the eating of the Roots of this pernicious and deleterious Plant, I find recorded by *Jacobus Wepferus*, in his Book *de Noxis Cicutæ aquaticæ*, and in the *Miſcellanea curioſa* or *Ephemerides German. Dec.* 2. *An.* 6. *Obſerv.* 116.

Wherefore I think it is for the Intereſt of Mankind that all Perſons be ſufficiently cautioned againſt venturing to eat of this, and indeed any other unknown Herb or Root, leſt they incur the ſame Fate; and in order thereto, that ſuch Hiſtories be made Publick and tranſmitted to Poſterity.

VI. *Several*

VI. *Several Experiments about giving Variety of Tinctures to Water*, &c. *Communicated to the Royal Society by the Right Honourable, Sir* Rob. Southwell, *V. P. R. S.*

FOR Red, *Tinctura Rosarum* Six Spoonfuls.

For a higher Red, *Syrupus Florum Punicorum*, One Spoonful; either of these to be mixed with Five of ordinary Water.

For Violet, One Spoonful of Syrup of Violets to Five Spoonfuls of Water.

Then to change the Rose Colour into High Green, R *Oleum Tartari per deliquium*, wash herewith the inside of the Glass, leaving a few Drops at the bottom, and then pour in the said Rose Tincture, and it will change.

To make the High Red Black.

Dissolve half the Bigness of a Walnut of *Sal Armoniack* in a Glass of Water, pour all out but Three or Four Drops in the Bottom, if the said Red be put hereinto, it turns as Black as ink.

To make the Violet Red.

Wash the Glass with the Spirit of Vitriol in manner aforesaid, and pour therein your Violet Water.

To make Red Wine Yellow as Sack.

Steep in White Wine, Brazil Wood 24 Hours, or else in ordinary Water, till it looketh Red, and pour in

the ſame time into a Glaſs, waſhed with Vinegar, it grows preſently Yellow.

To make this Yellow White.

℞ *Styrax Calamita* and *Benjamin* half an Ounce of each, Pulverize it and ſteep it in Four Ounces of *Aqua Vitæ*, of which a few Drops will turn the Liquor White.

Note, This maketh the *Lac Virginis* for the common Waſh.

Waſhing with clear Water, to make the Hands and Face Black.

Beat Galls into very fine Powder, and ſtrew it very Well and rowl it up and down into a Towel, then into a Baſon of Water, throw ſome Roman Vitriol, which will ſoon diſſolve, and after the Party hath waſh'd therein, it being clear and without ſmell, as ſoon as they wipe into the Towel all the Skin grows Black.

But in ſome Days, waſhing it with Soap, it will come off.

To renew the Luſtre of Chriſtal.

Boyl your Chryſtal in Fair Water, for a quarter of an Hour, and to a Proportion of Six Quarts of Water, add one Quart of Brandy Wine, letting the ſame continue to boyl half an Hour more; then take it out, and with the ſame Liquor rub it all over throughout, with a Bruſh; and then dry it with a clean warm Napkin,

kin, rubbing it in every part, and it will regain its former Luſtre.

To make the Hair grow.

Take the Roots of Burdock, or what they call Cuckold-Burs, which ſtick on the Cloths, of the largeſt Size in *December*; Boyl them in French Whitewine Eight Fingers high, till half be conſumed: Waſh the Head herewith, being warm'd at Night, and it makes the Hair come out, in caſe the Roots be good.

An Other.

Make a Lye of the Aſhes of Vines, and waſh the Head therewith, being Warm.

To hinder the Hairs from falling.

Put of the ſaid Vine-Aſhes, in Red Wine of *France*, and then filter all, and with that Liquor waſh the Head warm.

Memorandum, The Powder of *Hermodactiles* uſed in the Hair, as common Powder, does the ſame thing.

Pour faire du feu bleu.

Faites vous faire des Meſches auprès d'un cordier, qui ne ſoit pas trop fortement tordues. Fondez du ſoulfre dans un pot à feu de charbons, trempez les meſches dedans trois ou quatre fois ſelon que vous les aimerez d'avoir groſſes. Pour en repreſenter donc une Figure, on l'ebauche ſur des planches, puis on y attache en ſuivant ces traces, les meſches avec des cloux, & les rend un peu rabottenſes

en

en les battant avec un marteau, afin que la matiere ſuivante y tienne tant mieux. Celà fait, prenez de l'eau de vie forte, meslez y de la poudre à canon en farine, tant que tout ſoit en conſiſtence d'une bouill & frottez en lez meſches avec un pinieceau, & eſpardez encor deſſus, de la poudre en farine. Ainſi on laiſſe le tout ſecher & il ſerà preparè à l'uſage.

VII. *An Account of a very large Eel, lately caught at* Maldon *in* Eſſex; *with ſome Conſiderations about the Generation of Eels, by Mr.* Dale.

TO meet with Accounts and Deſcriptions of very large *Congers* or *Sea-Eales*, is not a thing rare or uncommon, among the Writers of Natural Hiſtory, and, among the reſt, the Learned and moſt Ingenious Mr. *John Ray*, my very good Friend and Neighbour, in his *Ichthyographia*, *pag.* 11. deſcribes it to be a very large Fiſh, in theſe Words, *Piſcis eſt longiſſimus, quatuor vel quinque Cubitorum longitudinem non raro attingens, & ſemoris humani craſſitiem æquans.* Conſonant to which, *Aldrovandus Lib. de Piſc. P.* 134. ſaith, *Sæpe in quatuor aut quinque Cubitorum longitudinem excreſcit*; and for Weight, *Salvianus* writes, *Non majores ſe vidiſſe quam triginta librarum*: Near to which Weight, Mr. *Daniel*, an Apothecary of *Colcheſter*, lately told me of one (if I miſ-remember not) that amounted to 27 or 28 Pounds. But if we may believe what *Eudoxus* writes, ſome are of a prodigious Magnitude; for he in his

his Book *De Terræ Motu apud Athenium, Lib. 6.* ſaith, *Congros multos in Sicyone capi quos Homo vix ferat, horumque aliquos etiam eſſe plauſtrales ſeu plauſtri magnitudine.* And *Strabo, Lib.* 3. *Geog.* affirms, *in exterioribus locis augentur ſupra minarum octoginta:* whoſe Authorities I ſhall not contradict, altho' neither by the Obſervations of the Worthy Mr. *Ray*, nor any other Modern Author, can I find any to acquire near that Bigneſs.

Yet to find very large *Eels*, notwithſtanding what is ſaid both by *Pliny* and *Solinus*, of thoſe found in the *Ganges* Thirty Foot long, is that which is rare and ſeldom (in *England* at leaſt wiſe) to be found, and therefore having lately met with Relations of Two very large *Eels* cought upon the Coaſt of *Eſſex*, I thought the Communication thereof to the Curious, would not be altogether unacceptable.

Theſe both had all the *Characterizing Notes* of the *Eel*, and wanted thoſe *Barbles* which the *Eel* ſometimes hath not, but the *Conger* is never without. The Firſt was taken ſomewhere about *Crickſea*, and for its rarity was made a preſent of to a *Noble Peer* of this *Realm*: Its Length from Tip of the Noſe to Tail's End, was Five Foot Eight Inches, and In Circumference it was Two and Twenty Inches; but as for the Weight, no Perſons could inform me what it was, tho' perhaps it might not exceed Twenty Pound, of which *Aldrovandus* ſaith, that in *Italy* they come up to, but never exceed it. And for Length it agrees with thoſe mentioned by *Rondeletius* to be ſometimes caught in the Lake of *Latera*, which were Three or four Cubits long.

But

But thoſe were far exceeded by one lately caught in *Maldon* Channel, about a Mile below the Town, the length of which was Seven Foot, the Circumference Seven and Twenty Inches, the Weight Six and Thirty Pounds, and out of its Belly was taken Five Pounds of Fat, its Skin was Black, and being ſtuft, is ſtill preſerved at *Maldon*, for the Inſpection of the Curious. This Fiſh was ſuppoſed to have been brought down thither by the Great Floods at the breaking of the laſt Froſt, becauſe of a Hurt it had on its Back, which the *Fiſherman* which caught it told me, he did conjecture it might be from ſome Mill it muſt paſs through.

Had it been my good Fortune to have had the Knowledge of this monſtrous *Eel* ſoon enough, I would have gone over to *Maldon*, to have ſeen it opened, it being a fit Subject in which to have examin'd the Parts of Generation, ſo much controverted, not only by the Ancient, but alſo by Modern Authors, and thereby been in ſome meaſure capacitated to have ſatisfied my ſelf concerning that no leſs controverted Point, the Manner of their Generation.

Many there are, that with *Ariſtotle*, will have the Generation of *Eels* to be *Spontaneous* or *Equivocal*, and will not allow them the Diſtinction of Sex; the Difficulty how *Eels* ſhould come to be in any Pool, Pond, Mote or Ditch, in which never any were put, they are not able to ſurmount, and therefore have vainly imagined them either to be produced from Mud, or from a peculiar Sort of *Dew*, falling in *May* or *June*, upon the Blades of the Graſs, whereof Turfs being cut, and the Graſſy Sides being together, and then laid

laid on the warmeſt Side of a well promiſing Pool or Pond, the Sun's Heat will thence hatch them; of which Original *Myllius*, in his Treatiſe *de Origine Animalium, lib.* 10. and *Morhofius de Metallorum tranſmutatione, p.* 38, 39. ſeem ſo well ſatisfied, that they give the Proceſs of this Affair, as practiſed by the *Dutch*, ſucceſsfully to ſtock their Fiſh-ponds with that ſort of Fiſh.

That the Generation of any Animal cannot be *Equivocal* or *Spontaneous*, but from Animal Parents, hath been ſo well, by many undeniable Arguments aſſerted, and by multiplied Experiments confirmed, by thoſe famous and celebrated *Virtuoſi*, *Malpighius*, *Redi*, *Swammerdam*, *Leewenhoeck*, Mr. *Ray*, and others, in their ſeveral learned and ingenious Tracts and Obſervations on that Subject, that I think there is no room left in the leaſt to doubt but that *Eels* have the ſame *Original*. And if we may credit what the ingenious Dr. *Plot*, in his *Natural Hiſtory* of *Staffordſhire*, *p.* 243. writes, concerning the Night Travels of *Eels* obſerved near *Bilſon* in that County, by Mr. *Moſely*, the Way of their ſtocking Ponds, *&c.* may not be altogether ſo improbable neither, as at firſt it may be thought to be, if we but conſider how long they will live out of Water, and though I cannot with *Pliny*, in his *Natural Hiſtory*, *Lib.* 9. *Cap.* 21. allow the time to be Six Days, yet I am ſure it may be long enough, to travel over a few ſhort Meadows, or from one Ditch or Pond to another, which may be performed in much leſs time than that of one Night; and if we may believe what *Geſner* in his Book of Fiſhes, *lib.* 4. *cap. de Anguilla*, quotes from *Albertus*, of a Parcel of *Eels*, which in a very cold Winter, *Anno* 1125. not only left their Na-

tural Element, but were found in a dry Meadow, beded together in a *Hay-ſtack*, the thing will ſeem more probable, to which let me add the Form and Shape of their Bodies, which by its *undulate* or *Serpentine* Motion is adapted to travel *in arido*: Neither are Eels the only Fiſh, which by Authors are affirmed to live *in Sicco*, but the *Exocetus* alſo mentioned by *Rondeletius*, with others ſo conſiderable for their Number, that *Theophraſtus Ereſius* wrote a Book of them, which was afterwards Commented upon by *Aurelius Severinus*, in a Book entituled *De Piſcibus in ſicco viventibus*, Printed at *Naples*, *Anno* 1655. Not to mention the *Cerian* and *Paphlagonian* Fiſhes, affirmed by *Ariſtotle* to wander up and down on the dry Sands, and then return back to Sea again, the like is alſo aſſerted of thoſe of the River *Cherati*, in *Judæa*, by *Geo. Pictorius*. All which, *Rondeletius* thinks *Eels*, as well as the aforeſaid Fiſhes, perform by the *Rima* of their *Gills*, being narrow and thereby capacitated to oppoſe the free, and too ſudden Appulſes of the Air.

Neither doth the Controverſy here terminate, for even among thoſe learned Perſons which oppoſe an *Equivocal* or *Spontaneous* Generation, the Diſpute is, Whether *Eels* have diſtinct *Sex*, or are *Hermophradites*. By ſome a diſtinct *Sex* is allowed them, for Mr. *Allen*, in his Account of the Generation of Eels, Publiſhed in the *Philoſophical Tranſactions*, *Numb.* 231. affirms the Parts diſtinguiſhing the Sex to be diſcoverable, and in this *Rondeletius* is poſitive, when he affirms, *Anguillas mutuo corporum complexu coeuntes ſe vidiſſe neque putare ſe partibus ad gignendum neceſſariis prorſus deſtitutas eſſe, inferiore enim ventris parte, & Vulva in Fœminis & ſemen in Maribus reperitur: ſed pinguidine*

pinguidine multa circumfusa hæ partes non apparent: And from hence, I mean from the parts of Generation being hid in Fat, might arise that mistake in *Aristotle*, which did occasion him so positively to affirm, *Anguillam neque marem esse neque fœminam.* And though it cannot but be granted, that that ingenious Inspector of Nature, Mr. *Lewenhoek*, hath, by the Help of his Glasses (which are very good ones) made many curious Discoveries in Animals and their Parts of Generation, yet never (to use his own Words) had he found a *Male Eel* that he could call so; for all those that he did Dissect, as in his Letter Published in the *Philosophical Transactions*, *Numb.* 221. he declares were provided with an *Uterus*, from whence he doth conjecture Eels to be *Hermaphrodites*, and besides the *Uterus* to be provided with *Masculine* Seed.

Another great Controversy about the Generation of Eels is, whether they are *Oviparous* or *Viviparous*, and many ingenious Persons I find there are, which cannot consent to an *Equivocal* or *Spontaneous* Generation, but strenuously oppose the same, yet firmly believe them to be *Oviparous*, whose Sentiments are contrary to the Observations of *Walter Chartwynd*, Esq; who in the Month of *May*, found them to be *Viviparous*, by cutting open the red Fundaments of the Females, from whence the Young *Eels* would issue forth alive: And although Mr. *Allen* affirms them to be certainly *Viviparous* yet his Observations concerning the Place of their Conception, I cannot conceive to be consonant to that Care and Industry of Nature, in providing convenient *Receptacles* for preserving the *Fœtus*, neither is it agreeable to Reason, to believe, that when Nature hath provided a *Uterus* in all Animals, not only the *Vivipa-*

rous, and ſuch as only cheriſh the *Embryo in Utero*, but in the *Oviparous* alſo, and *Inſects*, the *Eel* and *Xiphia* or *Sword-Fiſh*, mentioned by *Bartholinus Cent.* 2. *H.* 16. *Anno* 1654. ſhould be the only Animals without it, much leſs that the *Guts*, appointed by Nature for the *Secretion* of Nouriſhment, and the Expulſion of the *Fæces*, and are always in Motion, ſhould be the Place of Generation in any Animal; though we may allow Eels not to feed Groſs in the Winter. On the contrary, that the *Eel* hath an *Uterus*, is aſſerted by Mr. *Leewenhoeck*, who never found them without; which perhaps is that part which Mr. *Allen* names a ſlender Gland, tranſverſly lying near the Bowel.

Beſides, Nature having in all Animals, *Oviparous*, as well as *Viviparous* hitherto diſſected, provided not only an *Uterus*, but alſo *Tubes* (firſt obſerved by *Fallopius*) for the conveying the *Ovum* from the *Ovaria* to the *Uterus*. Another great Difficulty and Objection that lieth againſt Mr. *Allen*'s Obſervations, and in which indeed he ſeems to contradict himſelf, is this, whereas he ſaith that in one *Eel* he found *Eggs*, and thoſe on the out ſide of the *Inteſtine*; but in the other, Six Young ones, each faſtened to a ſmall *Placenta*, and thoſe within the great *Inteſtine*, called, the *Strait Bowel*, which adjoyns immediately to the *Pylorus*: How and by what Paſſages thoſe *Eggs* came into the *Inteſtine*, to be formed and invigorated, unleſs we may ſuppoſe they do, like the *Embryo's* of ſome ſorts of *Inſects*, which for the Conveniency of Food, eat their own Way into their *Heterogenious*, or aſſumed *Matrices*.

Theſe

Theſe Objections I have propoſed to be conſidered only that I might excite that Ingenious Perſon to perfect his Diſcoveries, and by ocular Demonſtrations to convince the Curious of the Truth and Certainty of his Obſervations, and finally to terminate this long continued Controverſy, concerning the Generation of *Eels*, and after what manner their *Coitus* muſt be performed; the Parts of Generation in the *Male*, being by him affirmed, to be affixt to the Extremity of the *Kidney*, and the *Embrios* in the Female, (as is before obſerved) found in that Bowel which adjoyns to the *Pylorus*.

IX. *An*

VIII. Account of a BOOK.

The History of Poland *in several Letters to* Persons *of* Quality, *giving an Account of the Ancient, and Present* State *of that* Kingdom, Historical, Geographical, Physical, Political *and* Ecclesiastical, *&c. with several Letters relating to Physick.* Vol. I. *To which is added a new Map of* Poland. *By* Bern. Connor, *M. D. Fellow of the Royal Society, and Member of the Colledge of Physicians*, &c. London *Printed for* Dan. Brown, *&c.* 1697. *in* 8*vo.*

IN this History of *Poland*, the Author gives an Account first of its Origine; that about the middle of the Sixth Century, it came to be a distinct Nation, when as yet it had no Cities, no Money, or written Laws; the first City was then Built by *Lechus* near the State of *Brandenburgh*, naming it *Guesna*; then treating of their Policy and Princes, which at first were called *Dukes*, he gives a particular History of all their *Dukes* and *Kings*, down to the present King *Frederic Augustus*. These he divides into Four *Classes*, the first beginning *An.* 550. ending *An.* 830. when the Government came into the Families of *Pirstus* and *Jagello*, to

to the Year 1574. which he profecutes through the Reigns of ſeveral Kings, down to *Sigiſmund* II. when the *Jagellonic* Race ended, which make the Second and Third *Claſſes*, caſually making ſeveral Remarks on the the Government, Nature of the People, and the like; with the times and occaſions of the Building of ſeveral of the chief *Towns* and *Cities*. The time of the *Teutonic* Knights Eſtabliſhment in *Pruſſia*; how the Latin Tongue came to be ſo frequent in uſe, when the *Lutheran* Religion came to be there Propagated; the *Jocular* Common-wealth of *Babina*, when and how Inſtituted. The fourth *Claſſis* conſiſts of mix'd Families, from the year 1574. to 1674. and here he obſerves when Courts of Judicature were firſt Erected, with the Original of the *Coſſacks*, and extent of their Dominions; their Country, Character, Cuſtoms, Religion, *&c.* and in all theſe Reigns gives an Account of their Wars and Victories, Policies, *&c.* with a particular Relation of the famous Raiſing the Siege of *Vienna*, by *John Sobieski* late King of *Poland*; and gives an Account of a Diſpute, he had himſelf, in his Court with ſeveral Divines, in the King's preſence, touching the ſeat of the Rational Soul in the Body, and cauſe of Death, not from the Separation of the Soul from the Body, but more properly from the Ceſſation of the Heart's Motion, the other being rather a Conſequent thereof. Here he relates the Circumſtances of the Princeſs's Mariage to the Duke of *Bavaria*, whom the Author attended as her Phyſician, in her Journey from *Poland*, the particulars whereof, with her Reception at *Bruſſels*, he relates, and gives ſome Account of the Election of the preſent King, which ends his Hiſtory of their Kings.

Next he gives a *Geographical* Deſcription of *Poland*, its extent, Provinces, Towns, Products, *&c.* As to the Towns, he ſays, the greateſt part thereof are Timber built, and Thatch'd, the whole Number of Cities, Towns and Villages, amounts to near 170000, of which not above Twenty are Walled; gives a particular Account of the Univerſity at *Cracow*, its Colleges and Learning, with the Churches and Monaſteries there, as likewiſe of the Salt Mine there, with the Manufacture and Revenue thereof, amounting to Eight hundred thouſand *Poliſh* Florins yearly: 'Tis obſerveable, that in ſome places of the Mine, the Vapours will take Fire from a Candle, ſo that they dare not work there. He alſo tells us of a particular ſort of *Manna*, gathered off the Ground, of which they make ſeveral ſorts of Diſhes for their common Food. Treating of *Pruſſia* he ſhews their way of making Glaſs: Speaking of the City of *Thorn*, he ſays, they have in a publick Library there, two of *Cicero*'s Epiſtles written upon Tables of Wax. In the Province of *Red Ruſſia*, on the Shoar of the River *San*, are found Trees Buried, very hard, and black as *Ebony*: Near the City *Kiow*, they ſhew the Bodies of Perſons long ſince Dead, and Preſerved in Caves of a Sandy dry Stone. There are ſeveral Obſervables touching the Liberality, and other particular Cuſtoms of the People, as the remains of Heatheniſh Superſtition and Sacrifices ſtill uſed, *viz.* by thoſe of the Province of *Samogitia*, &c. for which we refer to the Book itſelf.

Next he comes to ſpeak of the Origine and Extent of the great *Dutchy* of *Lithuania*, with the Deſcription of its Towns, and Succeſſion of its *Dukes*. In *Vilna* the chief

chief City thereof is a Bell, which requires above Twenty four ſtrong Men to ring it; and here likewiſe he mentions ſeveral Idolatrous Cuſtoms and Rites formerly obſerved; and ſpeaking of the Woods and Deſarts of *Lithuania*, he gives the Relation of ſeveral Children that have been bred up and ſuckled by the Bears, with their Cubs, with Obſervables of their eatting raw Fleſh, wild Honey, and Crabs; with the Difficulty of making them go Upright, bringing them to Speak, and the like, which ends this Volume.

At the end of this Treatiſe the Doctor gives a Compendious *Plan* of the Body of Phyſick, or his *Corpus rationale Medicum*, being his *Chymical* and *Anatomical* Method; for underſtanding the *Oeconomia Animalis*, the Nature of Diſeaſes, and the *Materia Medica*, as it was by him demonſtrated at *Oxon*, *London* and *Cambridge*; firſt of the *Elements*, *Fabrick*, and *Syſtem* of the *World*; then of the *Elements* of *Terreſtial Bodies*, next the *Structure* and parts of the *Human Body*, in all its particulars; and laſtly of the Union of the *Soul* and *Body*; coming to ſpeak of the *Materia Medica*, he affirms, *All inward Diſeaſes have their firſt Seat in the Maſs of Blood*; that there are no *Specifick* Medicines for any particular part of the Body, and that outward Applications cannot avail much for inward Diſtempers. He divides all the *Materia Medica* into Two *Claſſes*, evacuating and altering Medicines; where he reduces the *Chymiſtry* and *Reaſon*, the Nature and Operations of Medicines; this, he ſays, he endeavoured to demonſtrate at *Oxford*, &c. and here he gives hopes of his obliging the Publick in a few Years, with a Latin Treatiſe of the *Principles of Phyſick, and of the Oeconomia Animalis*; he ſubjoins a farther Explication and Vindication of the *Plan* of the

Animal Oeconomy; and here, in order to a general view of the Univerſe, he propoſes *Matter* as the firſt general *Principle* of all Bodies; and conceives Matter to be the only thing we have any clear Notion of, its Properties are *diviſibility* and *impenetrability*, one part of Matter differs from another only in bulk, motion, or figure, and according as it differs from others in one or more of theſe Qualities, they will conſtitute different Bodies; and he requires but theſe three Qualities, to give a general Account of the different parts of the World, as the *Stars*, the *Ætherial*, *Fluid*, and *Terreſtrial Bodies*: The *Atoms* of the firſt Matter have a leſs *Bulk* and more *Motion*, the *Atoms* of the Second Matter are properly *Spherical*, have as little *Bulk* but leſs *Motion*; the *Atoms* of the third Matter are of an *irregular Figure*, and *none*, or a *ſlower Motion* than the reſt; the *Stars* conſiſt of the firſt, the *Ætherial* Fluid of the Second, *Planets* and Terreſtrial Bodies of the third: The two firſt are exteriour Agents, and rather influence a Motion into the Terreſtrial Bodies, than enter into their Compoſition. Theſe then are his Principles by which he explains the *Phenomena* of Nature.

The laſt Letter is an Account of a Latin Treatiſe lately Publiſh'd by the Author, called *Evangelium Medici, ſeu Medicina Myſtica de ſuſpenſis Naturæ legibus*; in which he compares *ſupernatural* Effects Philoſophically, with *Natural* ones, and explains them by the Principles of *Phyſick*; and firſt he gives the reaſon of his Attempt, which was to Anſwer thoſe that denied the Being of Supernatural Effects, becauſe they could not apprehend them; in order to proſecute his Deſign, he lays down for a *Baſis*, the Structure of the Human Body,

Body, as far as it is discoverable by *Anatomy*, *Microscopes* and *Chymistry*; next the *Cause*, *Nature*, and *Laws* of *Motion*, which is the only true Cause of all natural *Phænomena*; and the Suspensions of these Laws of *Motion*, are the only Causes of all *Supernatural* Effects: Three ways these Laws may be suspended, and by one or more of those ways of Suspension, he conceives all Supernatural Effects may be solved. By *Suspension* he does not understand a changing or abrogating the Laws, only their Course being stopt for a time, while the Effect is produced. For a fuller Explication of this curious, and difficult Subject, we refer to the Learned Doctor's Letter, or rather to the Treatise it self, of which this Letter is but a short Abstract.

London: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the Princes Arms in St. *Paul's* Church-Yard. 1698.

PHILOSOPHICAL TRANSACTIONS.

For the Month of April, 1698.

Carigueya, *seu* Marsupiale Americanum.

OR,

The Anatomy *of an* Opossum, *dissected at* Gresham-College *by* Edw. Tyson, *M. D. Fellow of the* College *of* Physicians, *and of the* Royal Society, *and Reader of* Anatomy *at the* Chyrurgeons-Hall, *in* London.

THIS *Animal* was brought from *Virginia*, and presented to the *Royal Society*, by *Will. Bird*, Esq; and kept alive in their Repository for some time. But of late languishing and falling from its Meat, it died. The Cause of its Death we shall see, when we come to the Dissection: But first of all, we shall take notice of the several Names given it by different Authors: Then shall give a more exact Description and Figure of its outward Shape: And last of all, we shall observe the Structure and Formation of the Parts within; especially where different from other Animals.

And as to the *Names*, I find that *Georg. Margravius* (*a*), and so likewise *Gul. Piso* (*b*) tells us, That 'tis called in *Brasile*, and on the Sea Coasts *Carigueya*; by some, and in the In-land Contries, *Impatiima*. In *Perigauy*, *Tai-ibi*. *Franc. Hernandez* (*c*) saith, 'Tis called, *Tlaquatzin*, by the Indians. *Antonius Herera* calls it *Tayuatzin*; and the Modern Spaniards, by a Corruption, *Tlaquacum*; as *Joh. Eusеb. Nierembergius* (*d*) informs us. *Joh. Pet. Maffeius* (*e*), and *Caspar Barlæus* (*f*) calls it, *Cerigo*. *Joh. Lerius* (*g*) calls it *Sarigoy* or *Carigoy*. *Joh. Stadenius* (*h*) or *Stadius*, as he is Printed in *Theodore de Bry*, writes it, *Servoy* or *Serwoy*. By *Cardan* (*i*), and *Oviedo* (*k*) 'tis called *Chiurca* & alibi *Chucia*. In the *Molucca* Islands 'tis called, *Zurca*. In *Virginia*, and generally by the English, 'tis called *Opossum*, as by *Ralp Hamor* (*l*), and others. *Joh. de Laet* (*m*), and Captain *John Smith* (*n*) writes it, *Opassum*. Mr. *Ray* (*o*) calls it, the *Possum*; as do also our common Seamen. I do not find any *Latin* Name given to it by any Body, but by *Gesner* (*p*), who, that it might not be *Anonymous*, forms that of *Semi Vulpa*, *quasi Simia Vulpina*; or, as *Aldrovandus* (*q*) calls it, *Vulpi-Simia*, as if this Animal was of a middle Nature, between a *Fox* and *Ape*: And, answerably, in *Greek* it

---

N. B. *In my Quotations of any Author, if what occurs be in the same Book and Place, I always refer to the first Letter 'tis quoted by; if otherwise, 'tis distinguished by different Letters, which I choose, to avoid needless Multiplication of References.*

(*a*) Hist. Nat. Brasil. *l.* 6. *cap.* 2. *p.* 222. (*b*) Hist. Nat. & Med. *l.* 5. *c.* 24. *p.* 323. (*c*) Hist. Mexican. *l.* 9. *c.* 18. *p.* 330. (*d*) Hist. Nat. *lib.* 9. *c.* 4. *p.* 156. (*e*) Hist. Indic. *l.* 2. *p. m.* 46. (*f*) Res Gestæ sub Mauritio in Brasilia *p. m.* 222. (*g*) Hist. Navigat. in Brasiliam, *c.* 9. *p. m.* 180. (*h*) Hist. Brasilianæ. *Cap.* 32. *p. m.* 129. (*i*) De Subtilitat. *l.* x. *Oper. Tom.* 3. *p.* 531. (*k*) In Summario Indiæ Occident. (*l*) Descript. Virginiæ (*m*) Descriptio Indiæ Occident. *l.* 3. *c.* 17. *p.* 82. (*n*) *Voyages and Discoveries in* Virginia. *p.* 27. (*o*) Synopsis Animal. *p.* 182. (*p*) Hist. Anim. de Quadruped. *p.* 870. (*q*) De Quadruped. Digit. Viviparis, *l.* 2. *c.* 4. *p.* 223.

might

might be called, Πιθηκαλώπηξ, or Ἀλωπεκοπίθηκος; though he tells us, That the *Alopecopithecus* and *Chiurea*, by *Cardan* and *Scaliger*, are taken to be different Animals.

Upon the whole, since it is an Animal *sui Generis*, and in several Parts having a great Resemblance to those of different *Species*; I think, a *Denomination* might be best given to it, from that Particular, wherein 'tis most distinguished from all others; which is that remarkable *Pouch* or *Marsupium* it has in the *Belly*; into which, upon any Occasion of Danger, it can receive its Young. Not that it is a *Uterus*, or the Young Ones are bred there (this Mistake we shall clear up, when we come to the Dissection): But Nature has only formed this Part for that Particular *Use* of receiving or emitting, at Pleasure, the Young Brood, till such time as they are able to provide better for themselves.

This Consideration (it being so distinguishing a Character of this Animal from all others, that as yet we know of,) makes me most inclinable to find out some Name, that might be most expressive thereof; nor can I think of, at present, a better, than to call it, *Marsupiale Americanum*. If upon Observation (as very likely) there should be found different Species of these *Animalia Crumenata*, as *Jul. Cæs. Scaliger* (*r*) calls them, by an Epithite, they may be subdivided.

Bishop *Wilkins* (*s*), and Mr. *Ray* (*o*) too, in his *Synopsis Animalium*, places this Animal amongst the *Dog-Kind*. *Guil. Piso* (*b*) saith 'tis, "*Bestiola majorum Glirium Monta-*"*norum numero ascribenda*: And *Cardan* saith (*i*), "*Mittit & India Occidentalis Chiurcham è Mustelino* "*Genere*. I am apt to think it may be reduced to the

(*r*) De Subtilitate ad Cardan. *Exerc.* 206. *p. m.* 277. (*s*) *Real Character*, *Part* 2. *c.* 5. *p.* 159.

Vermine Kind; but that may be better determinated, had one an Opportunity of obſerving the *Male*; for our Subject was a *Female*, which I am now to give a Deſcription of.

And for the better doing this, I cauſed a *Figure* †† of it to be made, exact from the Life: for thoſe *Figures* that hitherto have been given of it, are very faulty; as will appear by comparing this with that of the *Caragueya* of *Margrave* (*a*), which is copied by *Piſo* (*b*) and *Johnſon* (*t*). The *Figure* of *Joh. Euſeb. Nierembergius* (*d*) indeed, ſeems to be taken from the Life, and more agreeable; but not in all Particulars exact: That in *Geſner* (*p*) is altogether Monſtrous; but withal, he tells us whence he had it; "*Imaginem addedi; qualis in Tabulis Geographicis depingi ſolet.*; and miſtruſts it himſelf, where he ſaith, *& Icon ſi quid ei credendum.* However, *Johnſton* (who never fails to copy an Error, and never mends one) adds this Figure too, *vid. ejuſd. Tab.* 58. though he owns that he had ſeen that of *Nierembergius*. The Figure of *Ulyſſ. Aldrovandus* (*q*) is much the ſame with that of *Geſner*'s. †† *Fig.* 1. *Tab.* 1.

Should one here indulge the Imagination ſo far, as in the Deſcription of this Animal, to borrow its ſeveral *Parts* from thoſe of different *Species*; one ſhould rather ſeem to form a Chimerical *Monſter*, than to deſcribe a real *Animal*. Yet we find the beſt *Zoographers* thus to pleaſe themſelves in their Accounts of it.

Animal eſt Tlaquatzin Canis parvi formâ & magnitudine, ſaith *Hermandez* (*c*). *Animal eſt Catuli vel Mediocris felis magnitudine*, as *Margrave* (*a*). *Pars anterior Vulpem, poſterior verò Simiam repreſentabat, niſi quòd Pedes effingit Humanos, Aures autem habet Noctuæ*, ſaith

(*t*) Hiſt. Animal Quadruped. *Tab.* 63.

Vin-

Vincentius Pinzonus (*u*). *Monſtroſum illud Animal Vulpino Roſtro, Cercopitheci Caudâ, Veſpertilionis Auribus, Manibus Humanis, Pedibus Simiam æmulans,* ſaith *Peter Martyr* (*w*). *Corpore verò ac Pedibus Melis,* the *Mexican Hiſtory* (*c*). *Videtur autem hoc Animal intermedium eſſe inter Leporem ac Vulpem, ſed alterius generis ab utroque ob Crumenan,* ſaith *Cardan* (*x*). *Eſt Viverræ facie ac magnitudine, Capite Vulpino,* ſaith *Jul. Cæſ. Scaliger* (*r*). *Opaſſum Capite Porcellum, Cauda Glirem referens, Mole modicum Felem,* ſaith *Joh. de Laet* (*m*). *Barbam Felinam habet,* ſaith *Piſo* (*b*). *Cauda Colubrinæ ſimilis, Hernandez* (*c*). I ſhall omit more Inſtances which might be given. Nor is it that I do diſapprove of theſe Alluſions upon the whole; but when they call it *Animal Monſtroſum,* as *P. Martyr* (*w*); or *Prodigioſum,* as *Vinc. Pinzonus* (*u*), and *Hieron. Benzon.* (*y*); I think 'tis only our *Ignorance* makes the *Admiration,* and that *Admiration* forms the *Monſter*; for *Nature,* in her regular Actings, produces no ſuch *Species* of Animals.

In our Deſcription of this *Animal,* we will firſt give the Dimenſions of this we diſſected; and then proceed to other Particulars. As from the Extremity of the *Noſe,* to the Tip of the *Tail,* it meaſured One and Thirty Inches: The Length of the *Head* was Six Inches: The *Tail* was One Foot long: The *Neck* and the *Body* was the Complement of the Firſt Dimenſion: The Girth of the *Body,* now dead, was Fifteen Inches and an Half; when alive and well, it ſeemed much thicker: The *Fore-Legs* were Six Inches long; the *Hinder-Legs* but Four Inches and an Half: The Girth of the *Tail,* near the Root, was Three Inches; near the Tip but One Inch:

(*u*) Navigatio inter Novi Orbis Scriptr. *p.* 86. (*w*) Ocean *Decad.* 1. *lib.* 9. (*x*) De Rerum Varietate, *Cap.* 33. *p. m.* 101. (*y*) Hieron. Benzon. Hiſt. Novi Orbis, *Lib.* 2. *p.* 52. apud Theodor. de Bry Americ. *pars quinta.*

The

The *Head*, about the Ears was largeſt; meaſuring on the *Forehead*, from one Ear to the other, Three Inches; thence gradually tapering towards the Noſe, and more reſembling that of a *Pig* than a *Fox*: The Aperture of the *Eyelids* were not Horizontal, but lying in a ſtrait Line from the Ears to the Noſe, and not large: The *Ears* were about One Inch and an Half long; not ſharp, but of a roundiſh Figure: The *Rictus* or his *Mouth*, from the Corner on One Side, to the End of the Noſe, meaſured Two Inches and an Half.

Theſe Meaſures, in ſeveral Particulars, I find different from thoſe in other Authors: But I cannot but think they have made ſeveral Miſtakes, for want of a more exact Enquiry and Obſervation. Thus *Margrave* (*a*), and, from him, others makes the *Fore-Legs* ſhorter than the *Hinder*; "*Crura duo anteriora* (ſaith he) *breviora, nimirùm quodlibet tres digitos longum; Poſteriora paulò plus quatuor:* In our Subject I find the contrary; tho', as we ſhall obſerve in the *Sceleton*, the Bones of the *Fore-Legs* are ſhorter than thoſe of the *Hinder*. He adds, "*Pedes Anteriores quinque digitis Inſtar manûs conſtant,* "*unguibus albis inſtar Avium, Curvis: Poſteriores longio-*"*res, uti in Cercopithecis eſſe ſolent, item quinque digitis ut manus.* But here we find the *Fore-Feet* to have Five long Claws or *Fingers*, equally ranging with one another; and a hooked *Nail* at the End of each Finger. But the *Hinder-Legs* are far differently formed; for here we obſerve but *Four Fingers* armed with hooked *Nails*, and a perfect *Thumb*, ſet off at a Diſtance from the Range of the other Fingers; and as in a *Humane* Body, this *Thumb* was ſhorter than the other Fingers; and had not a hooked or curved prominent Nail, but a tender *flat* one, as in our || Figure is repreſented.

|| *Tab.* I. *Fig.* I.

This

This Contrivance of the Feet and the Nails, and the Fore-Feet being longer than the Hinder, and the Hinder being formed with a *Thumb* like a humane Hand; ſeems very advantageous to this Animal, as to its way of living, and getting its Food: For what it ſeems to be moſt fond of, is, Poultry and Birds; not but that it eats other things too. But for the Preying upon theſe, 'tis very nimble in climbing up Trees; "*Scandit Arbores incredi-*"*bili pernicitate*, ſaith the *Mexican Hiſtory* (*c*); and the ſame is confirmed by all. Now having the *Hinder-Feet* formed like an *Hand*, and the Four Fingers Armed with hooked Nails, it may take the better Hold in raiſing its Body up a Tree; and the *Fore-Legs* being longer, will make the larger Stretch in Climbing up; the *Nails* being hooked and ſtrong, will take the greater Hold. Beſides, as we ſhall obſerve, having the Advantage of twiſting its *Tail* about any Stick or Bough it lights upon, and being able, by that Means, to ſuſpend the whole Weight of its Body; when it has a mind to raiſe it ſelf to the Bough its *Tail* is twiſted about, theſe Hinder-Legs, being formed like *Hands*, will the better take hold of it, than if they had no *Thumbs*.

Theſe Fingers, *Toes*, or Claws were naked, without Hair; the Skin looking of a Reddiſh Colour here. They were about an Inch long, and the *Thumbs* almoſt as long, but ſet lower, as I ſaid. The *Palmes* of all, eſpecially if dilated, as it does in Climbing, were large; but ſo contrived, as to be able to be contracted, as in walking; but that they might here be better ſecured from Injury, I find at the ſetting on of each *Toe*, in the Palmes, a Protuberant, Fleſhy, and almoſt Cartilaginous Body.

In feeding its ſelf, it makes uſe of the Fore-Feet in bringing the Food to his Mouth, as do the *Monkey* and *Squirril-Kind*.

As the *Toes*, ſo likewiſe the *Tail* was without Hair, only for a little way near the ſetting on; and was moſt remarkable; being *tapering* from the Root towards the Tip, and covered with a regular Order of ſmall Whitiſh *Scales*; which, for the moſt part, were all oblongiſh *Hexigons*, *Perſimilis Colubrinæ*, ſaith the *Mexican Hiſtory* (*c*): But with this difference, that in a *Snake's Skin* part of one *Scale* juts over another; but here each *Scale* appears wholly in view, and between each one may obſerve a little of the *Skin* or Membrane in which they are fixed. The Colour of theſe *Scales*, makes the *Tail* to appear Whitiſh, though the Skin ſeems of a Darker Colour.

As the *Feet* and *Tail*, ſo likewiſe the *Ears* were bare, and without Hair: *Auriculis tenuiſſimis*, *molliſſimiſq; ac penè tranſlucentibus*, ſaith the *Mexican Hiſtory* (*c*). And although thus ſoft and ſlender; and in Colour and Subſtance almoſt reſembling the Membrane of a *Bat's Wing*, yet they were erect, not acuminated or running to a Point, as deſcribed by ſome; but, as in our *Icon* is repreſented, more of a *Circular* or Oval Figure: They were ſo ſlender and ſoft, that here I could not perceive that *Cartilaginous* Body, which uſually is to be met with in the Structure of this Part, in moſt other Animals; but as if it was void almoſt of it, to be formed only by a Duplication of this tender Membrane or *Skin*; or if it did enjoy a *Cartilage*, as likely, 'twas much finer than in moſt other Animals. The *Concha* or Paſſage to the *Porus Auditorius* was very Capacious: But 'twas obſerved, that when our Subject began to grow ill, the Verge or Rime of the outward *Ear* ſeem'd to be crimp'd; and when it died, to be ſo ſhrivel'd, as if burnt up, not making a ſmooth, but jagged Edge.

The general Vogue of almoſt all *Naturaliſts*, reſembling the *Face* and *Head* of this Animal, to that of a *Fox*, would

would much incline me, could I find but a tollerable Agreement, to acquieſce herein: But by comparing both together, I ſee but very little Likeneſs. A *Fox*, 'tis true, has a large Forehead, and a ſlender *Roſtrum*; but in a *Fox* it does not gradually grow Taper (as in our Subject, from the Ears to the Noſe): But here the Forehead is Prominent, and ſomewhat Oval or Circular; then makes a remarkable Break; whence is protruded a ſlender *Roſtrum*. I much more think, in this Particular, our Animal reſembles that of a *Hog*: But Compariſons being ſo deluſive, ſo un-ſatisfactory to an inquiſitive Mind; and in all *Natural Hiſtory* not meeting with more, and to ſo little purpoſe, as in the Deſcription of this Animal; I ſhould rather think it far more adviſeable, to avoid the ſeducing the Mind into an Error hereby; than at the ſame time, when 'tis pretended to inform, to miſ-guide the Imagination by a miſtaken and ill-choſen *Simile*.

I ſhall only add, that the *Upper-Jaw* was ſomewhat longer than the *Under*: The *Noſtrils* were large; *Nares habet patentes*, ſaith *Margrave* (*a*): The *Eyes* Black, ſmall, vivid and exerted, when alive; now dead, very much ſunck: The *Neck* was ſhort: The *Breaſt* was broad; and the Shape of the whole is beſt apprehended by conſulting our *Figure* thereof.

It had *Muſtacio's* like a *Cat*; *Barbam habet Felinam*, ſaith *Margrave* (*a*); but his *Picture* of it is very much miſtaken. The *Fur* upon the Face is ſhorter and whiter than the reſt of the Body: The *Mexico Hiſtory* (*c*) deſcribes it *Roſtro tenui, prolixo & depili*; but this muſt be only meant comparatively. On the Back and Sides the *Fur* was of an Aſh Colour, or dappel'd with Black Hair in Spots, intermixt with White, eſpecially on the Back; on the Belly 'twas more of an Umber Colour, and of a darker on the Legs. The longeſt *Hairs*, which were

ſtronger and courſer than the reſt, meaſured Three Inches; being White towards the Ends: though the *Mexican Hiſtory* ſaith the contrary. *Pilo longo & candido, ſed circa extrema fuſco & nigro,* ſaith *Hermandez* (*c*). *Joh. Euſeb. Nierembergius* (*d*), in his *Figure* (which is much to be preferred before the others) repreſents him very Shocky, and, as it were, with Curled *Hair*. If what *Margrave* tells us be true, his Subject was different from ours; *Pili autem Capitis* (ſaith he (*a*) *Colli inferius cum fine Ventris & Caudæ inferius prope exortum, ſunt flavi ſecundum longitudinem autem Capitis, per Oculos & medium Capitis tendit ampla nigra ſtria.* But the Colour of the *Fur* may vary in different Subjects.

But we will have now done with the *Outward* Parts, to proceed to the *Inward:* But that we muſt firſt of all take Notice of that moſt remarkable Part, that no other *Species* of Animals enjoys, as I know of, but this; that is neither *Inward*, nor *Outward*, but a *Medium* between both; I mean that admirable contrived *Pouch* or *Marſupium* that it has in the hinder *Belly*.

For at the Bottom of the *Belly*, in the middle, between the Two Hinder Legs, we obſerved a *Slit* || or *Aperture*, moderately extended about Two Inches long; capable of a larger Extenſion by dilating it with ones Fingers, even when it is alive. *John Stadius* (*b*) ſaith, *in alvo fiſſuram habet ad dimidiæ Spithamæ longitudinem:* Or, as 'tis rendred by *Geſner* (*p*) *ad ſex digitos fere ſciſſum:* Poſſibly 'tis a little over ſtretcht; however, it can ſo exactly cloſe and contract it, that the Eye does not readily diſcover it, till dilated by the Fingers. "*Bur-*
"*ſæ os ita clauditur, ut non appareat, niſi duobus digitis*
"*ab invicim diſtendatur*, ſaith *Margrave* (*a*). *Tantâ æ-*
"*qualitate & vi, ut coaluiſſe cutim omnino putes*, ſaith the
"*Mexican Hiſtory* (*c*).

|| *Tab.* 1. *Fig.* 2. *and Fig.* 3.

This

This is ſo ſurpriſing a Structure, that all *Zoographers* do mention it with the greateſt Admiration; and yet their Curioſity has not been ſo great, but ſeveral Miſtakes they have been guilty of, in the Accounts they have given about it.

Mirum autem Animal (ſaith *Margrave* (*a*) *nam in infimo Ventre prope Crura poſteriora Vellis ejus dupla eſt, & exterior rima duos & ſemis digitos longa, facitq; quaſi Burſam, quem Braſiliani vocant, Tambeio, Pomi Aurantii majoris capacem. Eſt autem Burſa hæc intus Piloſa.* All of this, I think, is very juſt and true: For at the *Place* he mentions, we obſerved an *Aperture*, or *Slit*, much of the Largeneſs he deſcribes, where there is of each Side, a Reduplication of the Skin inwards, which forms a *Bag* of the Capacity he mentions, and of a greater upon Occaſion, and Hairy too. But theſe Hairs here are ſo thinly ſet, that by no means they cover it, but almoſt every where you may obſerve the Skin.

Gul. Piſo (*b*) has much the ſame Deſcription, but calls this *Burſa*, *Mantica*. *Cardan* (*x*) calls it *Crumena*. *Oviedo* (*k*) calls it *Ventrale Marſupium*. By *Joh. de Laet* 'tis ſtiled, *Aſcus ſub Ventre pendulus* (*z*). By *Fr. Ximenez*, or his Tranſlator (*aa*) *Pelliceus Saccus*. By *Jul. Cæſ. Scaliger* (*r*); *Scortum ſubventrale*. By *Peter Martyr* (*w*), *Uterus Exterior*. By *Hieron. Benzon.* (*y*), *Venter alter*. By Captain *John Smith* (*n*) 'tis called a *Bag*. The *Name* we ſhall uſe for it, will be, the *Marſupium* or *Pouch*.

Herein all agree, that the uſe of this *Bag*, *Pouch*, or *Marſupium*, is for the *Preſervation* of the Young Ones, and ſecuring them upon any Occaſion of Danger: *Qua-*

(z) Joh. de Laet. deſcripſ. Indiæ Occident. *lib.* 15. *cap.* 5. *p.* 551.
(*aa*) Vide Joh. de Laet. *ibid. lib.* 5. *cap.* 4. *p.* 232.

ternos, quinoſve parit Catulos (ſaith *Hernandez* (*c*) *quos Utero conceptos, editoſq; in lucem, Alvi Capacitate quadam, dum adhuc parvuli ſunt, claudit ac ſervat. Peter Martyr* (*w*) tells us, *Quod natos ſibi Catulos circumfert, quocunque profiſcatur, Utero exteri.e in modum magnæ Crumenæ dependente, &c. quo à venatoribus vel aliàs à cæteris violentis ac rapacibus Animalibus natos liberet, illos ſecum aſportando: nunquam autem illos emittere dicitur, niſi aut recreandi, vel lactandi Gratia, donec ſibi victum per ſe queritare dedicerint. Oviedus* (*k*) adds, *Quod Beſtia hæc ritu muſtelarum noctu domos ingrediatur, necanſq; Gallinas, earum ſanguinem tantum modo ſugat: imo illic Ventrale Marſupium aperit: filioſq; dimittit, ut & ipſi ad Gallinaceum ſanguinem ſorbendum aſſueſcant: interim ſi aliquem ſtrepetum ſenſerit, illico natos in crumenam recipiens, fugam arripit.* And *Joh. Stadius* (*h*) owns he has taken out the Young Ones hence; *Aliquoties eaſdem ipſe venatus ſum, & Catulos ex ſinu ipſemet deprompſi.* This Particular, I think, is evident by the Confeſſion of all; and therefore ſhall not uſe more Quotations to confirm it: And *Nierembergius* (*d*), on this Account, in his *Picture* of this Animal, repreſents the Young Ones as crawling out. But when they tell us, there is no other *Uterus*: But that the *Fætus* are formed here, and nouriſhed here; and this too, when they own they have *diſſected* this Animal; this is too great a Miſtake to be longer Propagated, and from *Autopſie* we ſhall demonſtrate the contrary, when we come to the Diſſection.

But ſince the great and wiſe Deſign of *Nature*, in contriving this Part, is for the *Preſervation* of the Young Ones, in receiving and emitting them as there is Occaſion; we will contemplate and admire the admirable Structure and Artifice ſhe uſes in forming and adopting it ſo ſuitably for this End.

We

We will therefore here remark the Structure of the *Muſcles*, which, like Strings, do ſerve to open and ſhut this *Pouch*. But in the doing this, we muſt firſt deſcribe thoſe Two remarkable *Bones* this Animal has, more than is to be met with in any *Sceleton* beſides, which are of great Uſe and Service herein: And, from their Office, I ſhall take leave to call them, *Oſſa Marſupialia*, or *Janitores Marſupii*. I do not find they have been yet taken notice of by any; and though they do belong to the *Sceleton*, yet I can't avoid their Deſcription here, becauſe of the *Muſcles* that are inſerted to them, that do ſerve to open the *Pouch*.

‖ *Tab.* 1. *Fig.* 5. These *Oſſa Marſupialia* ‖ or *Janitores Marſupii* (as I call them) are Two ſtrong *Bones*, ſo faſtened to the upper and inward Edge of the *Oſſa Pubis*, that at their *Baſis* here, they touch'd one another, juſt at the Coalition † of the *Bones* that forms the *Oſſa Pubis* =. The other Extreme of theſe *Bones* were ſo diſtant from one another, that it meaſured Two Inches and an Half. The *Baſis* * of theſe *Bones*, where join'd to the *Oſſa Pubis*, was half an Inch broad, having Two *Heads*; the larger ‖ lying near the Coalition of the *Oſſa Pubis*, and the leſſer † towards the *Os Coxendicis*; having in the middle a *Sinus*, into which was received a Protuberance of the *Oſſa Pubis*: By which Contrivance it appears, there can be no *Motion* of theſe *Bones*, nearer or farther from one another, but that they muſt ſtand always at an equal Diſtance. Nor did I, upon trial, find it otherwiſe; but obſerved, they were capable of a ſmall *Motion* inwards towards the *Spine*, and outwards from it. Theſe *Bones*, as they aſcended from the *Os Pubis*, grew ſlenderer, being about the Middle but a quarter of an Inch broad; and they were each, Two Inches long.

† *b.* = *a. a.* * *d. e.* ‖ *d.* † *e.*

To each of theſe *Bones* there were beſtowed Four Pair of *Muſcles*: There was *another Pair* that did run over them

them; to which theſe *Bones* did perform the Office of a *Trochlea*.

The *Firſt* Pair of *Muſcles* (*i.e.* which firſt came to be diſſected, upon the Pronation of the Animal, and from its Figure, I ſhall call, *Triangularis*) ariſes Fleſhy from the whole Length of the internal Side of theſe *Bones*, and inſerted their oppoſite *Tendons* on each ſide of the *Rima*, or Aperture of the *Marſupium*. Under part of theſe *Muſcles*, lay *another*, or a *Second Pair*; flat and thin; having their *Origin* from the upper Part of the internal Side of the *Oſſa Marſupialia* and *inſerting* their oppoſite *Tendons* a little above the *Tendons* of the former *Muſcles*, the Tendence or Direction of the *Muſcular Fibres* of this Pair, in Relation to the Firſt, made a Decuſſation. *The Third Pair* of *Muſcles* we ſhall take notice of, had their *Riſe* from the Fore-part of the *Baſis* of theſe *Bones*, where they were jointed to the *Os Pubis*; and were afterwards *inſerted* into the *Linea Aſpera* of the *Thigh-Bone*. The *Fourth Pair* did *ariſe* from the external Side of theſe *Bones* near the *Baſis*, and are *inſerted* into the Fore Part of the *Thigh-Bone* near the middle.

The *Laſt Pair* of *Muſcles* I hinted at, (to which I thought theſe *Bones* might perform the Office of a *Trochlea*, or *Pully*) *ariſes* more immediately from the *Marſupium* or *Pouch* it ſelf: For ſpreading their Muſcular Fibres all over this *Bag*, as they iſſue from it, by joining their Fibres together; they more remarkably form a ſolid *Muſcle*; which of each ſide *paſſing over* the middle of theſe *Bones*, (*i. e.* in the prone Poſture we are diſſecting it) at length were *inſerted* into the Spine of the *Os Ilii*.

By conſidering the Structure of theſe *Muſcles*, and what muſt be the Effect of their *Action* or Contraction; one cannot but think the *Two Firſt* muſt ſerve towards the Dilatation or *opening* this *Marſupium* or *Pouch*: For

theſe

these *Bones* are a *Fulciment* or *Basis*; their Articulation will not admit of a Contraction inwards or nearer to one another; wherefore, when the *First* and *Second* Pair of Muscles act or *contract*, they must necessarily *open* or dilate the Mouth of the *Marsupium* or *Pouch*. The *Third* and *Fourth* Pair of these Muscles may serve to *extend* these Bones outwards; so that when this Animal *hangs* by its *Tail* (as it does frequently) the *Weight* of the *Fætus* in this *Pouch* by this means will not press so much upon the inward *Viscera*. The *Fifth* and *Last* Pair, as they may serve to dilate the Capacity of the *Pouch* it self, so likewise may serve the better to suspend its Weight, when the Animal is *prono Capite*, and if it gravitates too much, they may retract it up, and the easier, because passing over these Bones like a Pully, their force is more augmented.

The *Antagonist* to these Muscles is, the *Sphincter Marsupii*; an oval *Series* of strong, fleshy Fibres, which serve to *constringe* and close the Orifice of the *Pouch*; which it does so perfectly (as I have already observed), that one would think the *Skin* here not to be *slit*; nor can the *Orifice* be observed till you have *dilated* it with your Fingers.

Nature's Contrivance therefore in placing this *Pouch* here, in this *Hinder* Part of the Body, is very great; her *Mechanism* in forming these *Two Bones*, the *Janitores Marsupii*, which no *Sceleton* besides has, and so artfully furnishing them with these Muscles, is most admirable; that with the *Philosopher*, there is none but must own Θεὸς γεωμετρεῖ.

The *Pouch* or *Marsupium* it self, was a Membranous Body, not very thick, tho' consisting of several Coats, and is to be reduced into the Class of the *Vesiculous* Parts of the Body; which according to my Notion, are part *Muscles*, part *Glands*, and do perform the Office of both,

Motion

Motion and *Secretion*: for the Concave or Hollow † of this *Pouch* (as I have remark'd) was somewhat Hairy; and at several Places I could observe them matted or cling'd together by a *Yellowish Substance*, which did ouze out of the *Cutaneous Glands* there; as under the *Armpits* in a Man, it is observed. *This Liquor* thus emptied into the *Pouch* from the *Glandulous Coat*, I found was strong *Scented*, and had more of the Peculiar *Fætor* of this Animal, than any part besides; being no ways grateful, but unpleasant to the Smell, as has been observed of this Creature, when alive: *Fætet Animal instar Vulpis vel Martis*, saith *Margrave* (*a*). *Vulpeculis Hispanienſibus sunt similes sed minores, & longe graveolentiores*, saith *Joh. de Laet* (*z*). But after the *Skin* with the *Pouch* had been kept for some Days, and was grown *dry*, I found so great an Alteration here in the Smell, that what before was so disagreeable, now was become a perfect *Perfume*, and smelt altogether like *Musk*; which made me call to mind what formerly I had remarked (*bb*) of these *Scent-Bags* in other Animals; that in a *Weasel*, which *Stinks* like a *Pole-cat*, by spreading this Fæted Liquor contained in the *Scent-Bags* (as I call them) on a Paper, and so letting it dry, it became a grateful Perfume, *&c.* wherefore afterwards, in my Description and *Anatomy* of the *Tajacu* (*cc*) (a *Mexican* Wild-Hog); when I came to dissect it, some Days after it had been dead; and the *Virus* or horred *Fætor* of the Liquor contained in the *Scent-Bag* (which was a large *Gland* on the Back) had spent its self, and it became an agreeable *Perfume*: Upon this Consideration, I took the Liberty (it may be, a too great an one) to call it *Moschiferus*;

† *Tab.* 1. *Fig.* 3.

(*bb*) Philos. Transact. *No.* 144. *p.* 39. (*cc*) Philosoph. Transact. *No.* 153. *p.* 379.

though

though the general Consent of all Authors had branded it with the Note of a *Fætid ſtinking* Animal. But at the ſame time, I inſtanced, that in the richeſt Perfumes we have, as *Musk*, *Civet*, and *Ambergrieſe*, the ſame is obſerved; and that Paſſage I quoted in *Gul. Piſo* (*dd*) concerning *Ambergrieſe*, is very remarkable.

Upon looking over this part of my Account of the *Tajacu*, I find this Paſſage (*cc*): "And I am apt to think, "'twas by removing theſe *Scent-Bags*, rather than ta-"king away the *Kidneys*, that they made the *Saragoy* "edible; which otherwiſe *ſtank* ſo much, that the "Barbarous Nations refuſed them; as out of *Lerius*, "*Joh. Faber* (*ee*) takes notice. *Joh. Lerius* his Words are theſe, as he is printed in *Theodore de Bry* (*ff*) *alia etiam invenitur* (*Beſtia*) *quam Saragoy appellant, quæ ob fætorem a Barbaris non comeditur, nos autem quibuſdam excoriatis, & detractâ Renum pinguedine, unde fætor ille manebat, ſine faſtidio edimus, carne enim cum tenera, tum optima eſt.* And I find my Conjecture was not amiſs; for although then I knew not where this *Scent-Bag* was placed, yet now I find it was the *Marſupium*, or *Pouch*; and that *Lerius* was altogether miſtaken in attributing this *Fætor* to the *Kidneys*, or the *Fat* about them; for I could not ſmell any thing ungrateful, or ill-ſcented there.

Upon this Occaſion, I can't but make a farther Remark upon the *Scent-Bag* of the *Musk-Deer*; which is likewiſe placed in the Belly near the *Navil*, and makes a large Cod. *Lucas Schröckius* (*gg*) has wrote a diſtinct Treatiſe about it; to whom I ſhall refer my Reader. But though there is this *Analogy* between our *Poſſum* and

---

(*dd*) De Indiæ utriuſq; re Nat. & Med. *lib.* 1. *p. m.* 17. (*ee*) Hiſtor. Mexican. *p.* 658. (*ff*) Americ. *part tertia p.* 180. (*gg*) Hiſtoria Moſchi.

the *Musk-Deer*, that both have their *Scent-Bags* placed in the *Belly*, and they have an *Aperture* there; yet the grand *Use* of the *Pouch* of the *Possum* is very different, as we have already seen.

Having therefore mentioned the *Glandulous* Coat of the *Marsupium* (on whose Account it may be reckoned as a *Scent-Bag*) I must here take notice that it had likewise a *Muscular* Coat, besides those several other *Muscles* bestowed upon it, which we have observed already, that gave it Motion. It had likewise a *Vascular* Coat too, being plentifully irrigated with *Blood-Vessels*, especially by Two large *Branches* that came from the upper part of the *Thorax*, and might be reckoned the *Mammaria*, as they are stiled in other Anima's. This *Pouch* was fastened by several Membranes to the Muscles of the *Abdomen* and the Skin; but so as I could separate it for the most part, with my Fingers.

But here I find, in this *Marsupium* or *Pouch*, they place the *Mammæ* or *Teats*; and they tell very odd Stories about it: I will only relate what they say of it, and what I at present observed, or rather, did not observe.

Joh. Petrus Maffeius (*e*) makes this *Pouch*, not *single*, but *double*, he places the *Mammæ* here, and the Young Ones to be so fixt to them, as if they almost *grew* there. *Illud autem mirum in Cerigonibus, ex ejus alvo duæ dependent veluti Manticæ, in iis catulos circumfert, & quidem adeo pertinaciter suo quemq; Uberi affixos, ut a perpetuo suctu non avellantur, antequam ad postum ipsi per se progredi valeant.* And much the same has *Casp. Barlæus* (*f*) *Cerigones* (saith he) *Vulpis magnitudine, insolito spectaculo alvum ostentant, è quâ duæ veluti Manticæ dependent, quibus catulos gestant, tam valido suctu Uberibus adhærentes, ut non antea demittunt, quàm adultiores ad pabulum ipsi excurrere valeant.* *Gul. Piso* (*b*) out does them *both*; for he makes them not only Nourished, but Formed here:

here: *Ex reiteratis* (saith he) *horum Animalium sectionibus alium non invenimus Uterum, præter hanc Bursam, in qua semen Concipitur & Catuli formantur. Quos deinde Quinos vel senos simul circumfert, mobiles, perfectos, sed depiles adeoq; pertinaciter Uberibus affixos, ut a perpetuo suctu vix avellantur, antequam permittente Matre ad pastum ipsi egrediuntur; unde redientes denuo, uterum maternum pro lubitu ingrediuntur.* So *Joh. Stadius*, as I find him Printed in *Theodor de Bry* (*hh*) *In Alvo* (saith he) *fissuram habet ad dimidiæ spithamæ longitudinem, intra eam alia Cutis subest, nec enim alvus hiat aut fathiscit, in eo sinu sunt Ubera, quocunque obambulat proles secum gestat.* So likewise *Peter Bembus* (*ii*), writing of the new discovered Islands, saith, *Animal eæ sylvæ nutriunt Cuniculi magnitudine, Gallinis infestissimum, cujus quidem fœmina loculum habet e Pelle Utero annexum, quasi Uterum alterum fœcundum Uberibus, in quo Catulos secum gestat, emittitq; cum vult.* And our Country-man, *Captain Smith* (*n*) seems of this Opinion too; where he saith, *Under her Belly she hath a Bag, wherein she lodges, carrieth and suckleth her Young.* But *Gillius*, as he is quoted by *Gesner* (*p*), tells us, That *non ex receptaculo prodeunt, nisi cum lac sugunt.* So likewise *Vincent. Pinzonus* (*u*), *Nec unquam exeunt Crumenam, nisi quum sugunt*; which intimates, That the *Teats* are not placed here, since they must go out to *suck*.

I must confess, upon what Observation I could make, I did not find any *Teats* here; nor indeed did I find them in the outward Skin; as is usual in other *Multiparous* Animals. Possibly this Subject never had a *Litter*; so for want of *drawing*, they might be less; so as to escape

(*hh*) Americ. Part Tertia. Joh. Stadii Hist. Brasilian. *cap.* 32. *p.* 129.
(*ii*) Hist. Venet. *lib.* 6.

our *View*, for the preſent: But in another Subject, I doubt not but that they may be diſcovered.

But this *Bag* or *Pouch* is not only appropriated to the *Female*, as one would gueſs by what *P. Bembus* (*ii*) ſaid before: But if we may believe *G. Piſo* (*b*), the *Male* has one too: "*Mas fœmellæ plane ſimilis, &c.* (ſaith he) *& quod notatu dignum, manticam* (*licet a fœmellæ diverſam*) *habet; qua alternatis vicibus Catulos quoque circumfert; ſicut avis mas amore pullorum, fœmellam ab incubatu ſubinde liberans.* I could have wiſhed he had given us an Account of the diverſity of the *Pouch* in the *Male*, from that of the *Female*; and had one an Opportunity of Diſſecting a *Male*, it would much illuſtrate the *Hiſtory* of this Animal. So likewiſe the Author of the *Preſent State* of his Majeſty's Iſles and Territories in *America*, (*pag.* 138.) tells us, That *the Male has ſuch another Purſe under his Belly, and takes his turn to carry the Young Ones, to eaſe the Female.* But more of the *Male*, when I ſhall come to mention the *Tai ibi*.

This Contrivance of Nature for ſecuring the *Young Ones* from any Danger, till they are able to ſhift for themſelves, I think, is not to be parallel'd in any *Species* of Animals, at leaſt of the *Quadruped* Kind, beſides. Not that ſhe is wanting in abundantly providing for their *Preſervation*; but ſhe pleaſes her ſelf in uſing infinite *Variety* in attaining the ſame End. Nor is there wanting Inſtances enough to evince it: What moſt reaches, and comes up to our Subject is, what I find recorded in *Oppianus* (*kk*) in his excellent *Poem* of *Fiſhes*: For in his *Halieuticks*, deſcribing the *Philoſtorgia* of *Fiſhes*, having mentioned the *Dolphin*, he comes to the *Dog-fiſh*, and tells us, that upon any Storm or Danger, if

(*kk*) Halieutic. *lib.* 1. *ver.* 332.

pur-

purſued, the *Young Ones run* into the *Mother's Belly*; and when the Fright and Danger is over, they *come out* again. I ſhall not think much to tranſcribe his *Verſes*; which were ſo admired by *Antoninus*, the preſent *Emperor* of *Rome*, to whom he made the Dedication, that not only for them, he revoked the Baniſhment of his *Father*; but preſented *him* likewiſe with a *Golden Statera* for each Verſe; whence they are called *Golden Verſes*: Which, according to *Suidas*'s Computation, came to Twenty Thouſand. *Suidas* (*ll*) his Words are theſe: Ἀναγνωσθέντων δὲ τῶν ποιημάτων αὐτῷ ὅτι τῷ αὐτοκράτορι, ἐδωρήσατο αὐτῷ πρὸς ἕνα στίχον ἐν μέτρῳ, στατῆρα χρυσοῦν, ἤγουν νόμισμα. ὡς λαβεῖν αὐτὸν ὅτι πᾶσι, νομίσματα χρυσᾶ μυριάδας ϛ.

And upon this Occaſion, *Oppian* not only inſtances in the *Dog fiſh*, but in the *Squatina*, and *Glaucus* too: But there are different *Receptacles* he does aſſign, that theſe *Two latter* do make uſe of, for the receiving their *Young*, in Caſe of Danger. *Oppian*'s (*kk*) Verſes are theſe:

Ιχθύσι δ' αὖ δελφὶς μὲν ἀρηϊδύει φιλότητι
Παίδων· ὡς ἢ κ' ἄλλοι ἑὸν γένος ἀμφιέπωσι.
Θαῦμα δ' ἁλιπλάγκτοιο κυνὸς τόδε. τῇ γὰρ ἔπονται
Τέκνα νεοδλαῖς, καί σφιν σάκος ἔπλετο μήτης.
Ἀλλ' ὅτε ταρβήσωσι, τότ' ἄσπετα δείματ' ἔχουσιν
Ἐν πόντῳ, τότε παῖδας ἐνὶ λαγόνεσσιν ἔδεκτο
Αὐτῇσιν εἰσάθμοισιν, αὐτῇσι δόδυν, ἔνθεν ὄλισθον
Γεινόμενοι. τοῖον δὲ πόνον μογέουσά περ ἔμπης
Ἀσπασίως τέτληκε, πάλιν δ' ὑπεδύσατο παῖδας
Σπλάγχνοις· ἀψ δ' ἀνέπνευ, ὅτ' ἀμπνεύσωσι φόβοιο.
Τοίῃσιν ῥίνη τεκέων πορσύνει ἀλκήν,
Ἀλλ' ὅκ ἐς ὑδαρὴ κείνη δύσις, οἷα κύνεσσιν·

(*ll*) In Voce Oppianus.

Αλλα

Αλλὰ οἱ ἐν πλοὺρῇσιν ὑποσφάγες ἀμφοτέρωθεν
Εἰσιν ὑπὸ πλεύγων, οἴη γένις ἰχθύσιν ἄλλοις·
Τῇσιν ἀτυζομένῳσι, τεκέων φόβον ἀμφικαλύπτει.
Ἄλλοι δ' αὖθ' ἑὰ τέκνα διὰ στόμα ταρβήσοντα
Δεξάμενοι ῥύονται, ἅτ' ἐς δόμον ἠὲ καλιήν.
Οἷον δὴ κ' γλαυκῷ, ὅς ἑξοχα τέκν' ἀγαπάζει
Πάντων, ὅσσοι ἔασιν ἐν ἰχθύσιν ὠοτοκῆες.
Κεῖνῳ γὲ μίμνει τε παρήμενῳ, ὄφρα γένωνται
Παῖδες ὑπωπάδιοι, καί σφιν παρακνήκι' ἀιεὶ.
Τὼς δ' ὅτε κεν τρομέοντας ἴδῃ κρατερώτερον ἰκθύι,
Ἀμφικανὼν κατέδεκτο καλὰ στόμα, μέσφα κε δεῖμα
Χάσκῃ· τότε δ' αὖτις ἀνέπτυσε λᾶκανίηθεν.

Which an ingenious Friend of mine has thus tranſlated: And indeed, the whole *Poem* is ſo fine, ſo noble and rich a Thought; that if the *Tranſlation* of it was attempted by ſome good *Genius*, he would find Charms enough in it to raiſe his Fancy; and a Subject Worthy his greateſt Skill.

None to their Young *ſo kind as* Dolphins *are;*
Tho' other Fiſh *of theirs, expreſs their Care.*
This in the Dog-fiſh, *we with Wonder ſee;*
To whom her trembling Whelps *from Danger flee.*
For when a dreadful Storm imbroils the Deep,
Within her Bowels, *they for Refuge creep;*
They paſs directly to her Womb; *the Way*
By which excluded, firſt they ſaw the Day.
She, tho' diſtended, and in torturing Pains,
The bulky Burden patiently ſuſtains,
While the loud Terrors of the Tempeſt laſt:
But when the Danger, and their Fears are paſt,
Strait from her ſuff'ring Womb, *the* Whelps *retreat,*
And ſhe her Labour, they their Birth repeat.

The

The Squatina *do's the ſame Love betray,*
As Dog-fiſh *do, but in a different way.*
Nature has Bags *on either ſide prepar'd*
Beneath her Gills; *where ſhe do's hide and guard*
Her frighted Young; *with ſudden Danger ſcar'd.*

Some thro' the Parent's gaping Throat *deſcend;*
Whom as a Houſe, or Neſt, their Maws *defend.*
The Glaucus, *for Affection, is by none*
Of all the Fiſh Oviparous *out-done.*
Cloſe by her Spawn, ſhe does unwearied ſtay,
Her Off-ſpring to protect from Fiſh of Prey.
And when, with tender Fins, they ſtrike the Tide,
She with them ſwims, their conſtant Guard and Guide,
For if it happens, that the trembling Fry
Do ſome Voracious Enemy deſcry,
Opening her Jaws, ſhe kindly does devour
Her Young; *to ſave them from th' Invaders Power.*
Their Fears remov'd, ſhe ſpues them up; to eaſe
Her Labour, and reſtores them to the Seas.

I muſt confeſs, I would not expect in a *Poet*, that Nicety and Exactneſs of *Natural Hiſtory*, as in a *Philoſopher*, who is not to give a looſe to his Imagination, but truly to relate Matter of Fact. But this Particular of the *Dog-fiſh*, with me, bears the more Reſemblance of Truth; for formerly, diſſecting a *Fiſh* of this *Kind*, that was a *Female*; as it was ſurpriſing to me at the ſame time, to obſerve here the *gradual* Formation of ſeveral *Fœtus*; ſome juſt beginning to be formed, others an Inch long or Two; others Four or Five; ſome Nine or Ten, and fit for Birth: So what comes moſt to our Buſineſs was, That near the *Exit* of the *Pudendum* of each ſide, I obſerved a *Foramen* or Hole that was capa-

ble

ble of Extenſion, and readily enough would admit my Finger, which led into the Cavity of the *Abdomen* or Belly it ſelf; and not into any *Bag*, or the *Uterus*, or any other Part. *Beſides*, in the *Abdomen* I found a Quantity of Water, which I could not but think was let in this Way. So that if upon Obſervation at any time, there ſhould be found looſe in the Cavity of the *Belly* of this Fiſh, a *Young* one; there would be no Reaſon to miſtruſt the Relation, ſince here are Two *Doors* to let them in and out.

Ælian (*mm*) relates the ſame Story of the *Dog-fiſh*; his Words, as they are tranſlated by *P. Gillius*, are theſe; *Si quis eorum* (ſpeaking of the Young Ones) *timeat, ingreditur rurſus per Genitalia in Ventrem Matris; ubi timor abierit, is prodit tanquam rurſus editus.* And in the preceding Chapter he tells the ſame (as our *Poet* does) of the *Glaucus*: And that Paſſage of *Zeza*, as 'tis quoted by the Learned *Conrad. Ritterſhuſius* (*nn*) is very expreſs: Γλαῦκος, κύων, ἢ γαλεὸς, θαλάττιοι ἰχθύες ἐπερχομένῳ δέιμαλῳ τοῖς τέκνοις τοῖς οἰκείοις, ὁ γλαῦκῳ μὲν ἢ γαλεὸς τῷ σόμαλι συγκρύπτει, ὁ κύων ἢ κρύπτει ταῦλα πάλιν ἐν τῇ νηδύϊ, καὶ πάλιν ταῦλα γεννᾷ τὸ φόβῳ παρελθόνλῳ. Nay, *Ariſtottle* (*oo*) himſelf acknowledges the ſame thing of the *Galeus*, which is of the *Dog Kind*: Ὅι μὲν ἓν ἄλλοι γαλεοὶ καὶ ἑξαφιᾶσι καὶ ἢ δέχονλαι εἰς ἑαυλὲς τὰς νεοσλὲς, ἢ ἀι ῥῖναι, ἢ ἀι νάρκαι. Which *Jul. Cæſ. Scaliger* thus tranſlates, *Cæterum Muſtelorum genera & emittunt & admittunt intra ſe Catulos; item Squatinæ & Torpedines.* And the like he (*pp*) affirms of the *Dolphin* and *Porpois*: Κὶ εἰσδέχονλαι ἢ τὰ τέκνα μικρὰ ὄνλα. But after all, if what is thus related of theſe *Fiſhes* ſhould prove but a vulgar

---

(*mm*) Hiſt. Animal. *l.* 1. *c.* 18. (*nn*) Comment. in *lib.* 1. Halieut. *p. m.* 214. (*oo*) Hiſt. Animal *lib.* 6. *cap.* 8. *p.* 677. (*pp*) Hiſt. Animal. *lib.* 6. *cap.* 10. *p. m.* 682.

Error,

Error, 'tis one of a very *Ancient* Date; and it is high time it was removed: and if there ſhould be any *Truth* in theſe Stories, for the gaining a greater Belief thereto, 'tis requiſite that 'twas ſupported by ſome more *evident* Proof, and confirmed by *later* Obſervation. But what we mention of our *Quadruped*, the *Poſſum*, is notoriouſly known and agreed on of all Hands; to whom, after this Digreſſion, (too large an one it may be) we ſhall now return; and ſhall therefore be more conciſe in the Deſcription of the other *Parts*; and ſhall chiefly take Notice of thoſe only, wherein I find ſomething remarkable, and different from the common Make of the ſame *Parts* in other Animals.

And for this Reaſon I have very little to ſay of thoſe *Parts* in the *Thorax*, I only obſerved, that the *Lungs* had Three *Lobes* on one ſide; and but One on the other: But this One, was as large as the other Three. They were ſoft and ſpongy, and eaſily dilated, and large proportionably to the Animal.

The *Heart* was included in a *Pericardium*, as uſually; but the *Heart* it ſelf I thought proportionably larger, in reſpect to the Bulk of the Body, than is commonly; nor was its *Cone* ſo ſharp, but rather more obtuſe. It had Two *Auricles*, and Two *Ventricles*.

About the *Throat* there were large *Glandulæ Maxillares*. The *Tongue* was a little above Three Inches Long, about Three Quarters of an Inch broad; 'twas rough, having ſeveral Protuberances, whoſe Points looked inwards. *Lingua longa* (ſaith) *Margravius* (*a*) *quam tamen os aperiens & morſum minitans non exſerit, quamvis poſſit, ſed verſus poſteriora attollit.* The *Voice* or Noiſe it made, was a little *Growling*.

But meeting, or at leaſt not obſerving any thing farther extraordinary here, we ſhall haſten to the *Abdomen*,

where we ſhall find more Matter to excite our Admiration, and pleaſe our Curioſity.

The *Abdomen* or *Belly* was divided from the *Thorax* or *Breaſt*, by a large, ſtrong, fleſhy *Diaphragm*, for (as we ſhall obſerve in the *Sceleton*) the *Thorax* near the Throat was ſmall; then gradually, as it deſcendeth, it enlarges its Capacity; ſo that here, where the *Diaphragm* was faſtened, its Compaſs was very great and large; which might be rendred ſo the more, by reaſon it often hangs by its *Tail*; and when it does ſo, the *Viſcera* in the *Abdomen* can't but preſs upon it. But that they might not too much, to the Injury of the Animal; we ſhall ſee what Proviſion Nature has made for it, by her great Contrivance in ſuſpending the *Inteſtines*.

But we muſt obſerve and deſcribe the † *Stomach*, or *Ventricle*, which was ſeated under the *Diaphragm*, having part of the *Liver* lying over it; its Figure ſomewhat reſembling the uſual make, inclining to that of an *Half Moon*; as appeared by that Hairy || *Tophus* we afterwards took out of it. But what was moſt remarkable was, the Structure and Poſition of the Two *Orifices*, (*viz.* that of the * *Gula*, that leads into it, and the *Pylorus* †, that ſends out) for they were both placed ſo near one another, that they ſeemed to touch or meet; and when I opened the *Stomach*, I found only a very ſlender *Iſthmus*, or *Wall*, parted them. Theſe *Orifices* were not at the Extreams of the *Stomach*, as uſually; but inſerted almoſt in the Middle of the upward Part, but more inclining towards that, that reſpects the || *Duodenum*. The pouching or *bagging* † out at both Extreams, made it ſomewhat reſemble (as I ſaid) an *Half Moon*. The *Stomach* appeared but ſmall, being much contracted, for it had not eaten any thing for ſome Days; it meaſured about Three Inches and an Half in length, and about

† *Tab.* 2. *Fig.* 1. *B.*

|| *Tab.* 2. *Fig.* 2.

* *Tab.* 2. *Fig.* 1. *A.*

† *Ibid. e.*

|| *f. f.*

† *D D.*

about Two Inches in depth: The *Gula* which coveys the Food into the *Stomach*, consisted of strong Muscular Fibres, and was in all about Nine Inches in Length. The *Pylorus*, that carries out, seem'd to have its Passage free and open, without that *annular* Constriction or *Valve*, as in most other Animals; though here we observed a larger Body of *Muscular* Fibres, than in the other *Intestines*; which made me wonder how a *Regurgitation* of the *Fæces* into the *Stomach* was prevented; but this we will consider anon.

But before we opened the *Stomach*, I observed at one
* c. Side a *Perforation* * or *Hole* thorough, about the Bigness of an ordinary *Pea*, and *Round*. That it was occasioned by an *Ulcer* there, I plainly perceived by the Lips or Edges; which were not fresh, but had an ulcerated *Matter* about them; and this, without doubt, was the Occasion of its Death; for it had fallen from its Food, and had pined away for some time before, and by its uneasy Motion, made its *Keeper* suspect, it had swallowed something that stuck in its *Throat*, or injured its *Stomach*.

A like Accident as this (as a *Perforation* of the *Stomach*) I have Three Times met with in dissecting *Human Bodies*; and the last (being joined with another *Physitian* in Consultation, a little before the *Patient's* Death) I foretold; and upon Dissection found confirmed. What appears to me, to be most likely to be the Cause of this *Perforation*, is, that some of the *Glands* in the *Stomach* (such as *Payerus* (*qq*) and Dr. *Grew* (*rr*) describes in the Intestines) being become *Scrophulous* or *Steatomatous*, might impostumate and so corrode the Coats of the *Stomach*, and cause a

---

(*qq*) Exercetat. Anat. Med. de Glandulis Intestinorum. (*rr*) *Comparative Anatomy of Stomachs and Guts.*

Perforation. And the rather I am of this Opinion, becauſe in thoſe Inſtances I mentioned of *Human* Bodies, I found in other Places of the *Stomach*, theſe *Glands* very large and *Steatomatous*; tho' Naturally they are but ſmall, and often not obſerved. Where there is a *Perforation* of the *Stomach* upon an *Inflammation*, and upon that an *Impoſtumation*; there the *Foramen* is larger and not regular: as remarkably I once met with it in a Child, where a large part of one ſide of the *Stomach* was *Sphacelated.* So likewiſe upon a *Corroſive Poiſon* taken, its Effects dilates its ſelf more, and is not confined to ſo narrow a Compaſs; as I obſerved once in one who had taken *Rats-bane.*

Upon obſerving this *Perforation* of the *Stomach*, I looked to ſee, whether any of its *Contents* had been emptied into the Cavity of the *Abdomen*; but could find little or nothing: Nor indeed, when I came to open the *Stomach*, could I find any thing that could be evacuated that Way; for there was nothing contained in the *Stomach*, but a Body || of *Clotted Hair*, formed into the || *Tab.* 2. Shape and Figure of the *Stomach*, ſomewhat like an *Half* *Fig.* 4. *Moon*; covered with a ſlimy viſcid Subſtance, which did ſerve the better to glue theſe *Hairs* together. Theſe *Hairy Tophi* are frequently to be met with, in the *Stomachs* of *Bruits*, and I have had, and ſeen ſeveral, which have been taken out of *Oxen*; and the *Butchers* inform me, that they chiefly meet with them in the *Winter* Seaſon, after the *Hair* begins to ſhed; and the Cattle feed upon Hay and dry Meat: But after the *Spring*, and in *Summer*, they do more ſeldom find them; as if the *New Graſs*, which Purges them, did contribute to diſſolve theſe *Tophi* likewiſe. *Georg. Hieron. Velſcius* has wrote Two *Medico Philoſophical Diſſertations* (ſſ) about

(ſſ) De Ægagropilis.

theſe

these *Tophi*, that are found in *Goats*; and others has made distinct *Treatises* thereon; to whom I refer the Curious: and *Gul. Piso* (*tt*) gives a Figure and Description of one.

But our Animal is *Carnivorous*, and in what all Accounts agree in, most *Rapacious* of the *Winged Kind*; and where it can't find its Prey on the *Land*, it will hunt for it in the *Trees*; most nimbly climbing them up: and if the tender Bough cannot bear the Weight of its Body on its Feet; by twisting its *Tail* about the Twig, it can hang thereby, and stretch it self the farther, to obtain its desired Food, or rob a Nest. Nay, if I am not mis-informed, by this Means it can *Fly*, or pass from one *Tree* to another, without descending down; for thus hanging by its *Tail*, and waving and swinging its Body like a *Pendulum*, it can fling it self into the Boughs of a Neighbouring *Tree*; where his Tail is sure to take fast hold of the first Bough it lights on, if otherwise it misses his *Footing*: and, as I have shewn, his hinder Legs being made like *Hands*, with a *Thumb*, it can more readily raise its Body up by them.

Noctambulum Animal est (saith *de Laet* (*z*) *& cum cæteris Avibus, tum Gallinis infestissimum. Georg. Margrave* (*a*) saith, *Mordax est, vescitur libenter Gallinis, quas rapit, ut Vulpes, & Arbores scandendo, avibus insidiatur, vescitur quoq; sacchari cannis, quibus sustentavi per quatuor septimanas in cubiculo meo.* So likewise *Gul. Piso* (*b*) *Mordaces sunt ut Vulpes earumq; more Gallinis & Columnis non solùm, sed Avibus in fastigiis Arborum insidiantur; quarum defectu Cannis sacchareis aliisq; optimis vegetabilibus vescuntur.* So that they are not only *Carnivorous*, but when *need* drives them, they can take up

(*tt*) Hist. Nat. & Med. *lib.* 5. *p.* 327.

with

with other *Food*. *Scandit Arbores incredibili pernicitate* (ſaith the *Mexican Hiſtory* (c) *diu in Cavernis latitat, veſcitur Cohortalibus, quas Vulpecularum, Muſtelarumq; ſylveſtrium more, jugulat, illarum ſanguinem abſorbens.* And afterwards adds, *Vivit enim in Calidis, ac paſcitur Carne, fructibus, Pane, Oleribus, frumentaceis, aliiſq; generibus, veluti nos experimento cognovimus, alentes illud domi, ac in deliciis habentes.* Which laſt Account ſeems *true*; for this that we diſſected would *eat* any thing, that was brought from the Table.

We ſhall now obſerve how the *Food*, when it is received into the *Stomach*, and contained there, till 'tis throughly digeſted, is afterwards diſpenſed with the greateſt Advantage, for the Nouriſhment of this Creature. And what I hinted, how 'tis, that a *Regurgitation* of it into the *Stomach* again, is prevented; eſpecially upon the Poſture 'tis frequently in, when it hangs by its *Tail*, ſince (as I obſerved) the Paſſage at the *Pylorus* is ſo open and *patent*. And for the doing this, we muſt expect *Nature's* Contrivance (which is always admirable) to be great; not confining her ſelf ſtill to the ſame Rules; but is *Infinite* and *All wiſe*, in attaining the ſame *Ends*, with the greateſt *Variety* and *Mechaniſm*.

Which leads me to conſider the Structure and Order of the *Inteſtines*: But in doing this, I muſt firſt take Notice of the *Meſenterie*, that Membranous Part which colligates them, and fixes their Situation; and gives to them the Order of their Figure. For the *Inteſtines* are not juſt faſtened to the *Peripherie* or outward Circumference of the *Meſenterie*; but the outward Membrane of the *Meſenterie* of both ſides, is entirely projected and continued over the whole *Canalis*, or Duct, of the *Guts*; and is to them the outward or *common Membrane*: So that I have often, by ſeparating this *outward* Membrane, from what lies under it, the *Muſcular*; I have extracted

the

the whole length of the *Guts*; leaving only the *Common* Membrane, as'tis continued from that of the *Meſenterie*; which I could inflate, as if the whole of the *Guts* remained.

Now here we obſerved that remarkable Difference, from what is in many other Animals; that we can't but make Two *Meſenteries*; *one* peculiar to the *ſmall* Guts, the *other* belonging to the *great* ones, or *Inteſtina Craſſa*, as they are called; for tho' continued to one another, yet the difference in their Figure or *Bulk*, is ſo much, that fully juſtifies the Diſtinction. And for Diſtinction ſake, I ſhall call the former *Meſenterium* * *minorum*, and the latter *Meſenterium* † *Majorum*, ſc. *Inteſtinorum*: for *minora* and *majora* I think more expreſſive, than *tenuia* and *craſſa*; at leaſt it appeared ſo in our preſent Subject.

* *Tab.* 2. *Fig.* 1. *u.* † *w.*

For here I remarked, that as the || *Duodenum* deſcended from the *Stomach*, it ran under the † *Colon*, (juſt where 'tis joined to the *Cæcum* *) towards the Middle of the *Spine*. Hence I found a Projection of the firſt *Meſenterie* || into a *Spiral* Line, like a *Cochlea* or winding Pair of Stairs: So that upon Inflation, theſe *Inteſtines* here, made ſeveral *Convolutions*, or *Windings*, tho' not exactly *Spiral*, but as repreſented in our *Figure*; and the better to ſhew the Currency of their *Canalis* here, and how thoſe *Gyrations* follow each other; I have ſignified it by the Order of the Letters of the *Alphabet*; ſo that (*g*) is ſucceeded by (*h*) and (*h*) by (*i*) and ſo on: Not that I could repreſent the whole in this *Figure*; for ſome of theſe *Gyri*, at leaſt great parts of them, lay dipt and hidden by others, that lay over them.

|| *f. f.* † *f.* * *r.* ‖ *w.*

The Second *Meſenterie* †, or *Meſenterium majorum*, as I chooſe rather to call it, than *Meſocolon* (for it did belong likewiſe to the *Cæcum* || and * *Rectum*, as well as the *Colon* †) was projected more in a *Plain*; and made al-

† *w.* || *r. r.* * *t.* † *ſ. ſ. ſ.*

moſt

moſt a *Circular* Figure at its *Peripherie*; ſo that the *Cæcum*, and *Colon* did almoſt entirely encircle the *ſmall Guts*.

The *ſmall Guts* (as here inflated) meaſured about Six Feet and an half in length. The *Cæcum* was about Six Inches long; and the *Colon* and *Rectum* Two Foot long. The Girth of the *Duodenum* (I mean all along here, as inflated) was Three Inches; the *Ileon* || Two In- || 4
ches and an Half; the Girth of the *Cæcum*, in the largeſt Place, was Six Inches; of the *Colon* Four Inches; and the *Rectum* was Three Inches about. from the *Spine* to the utmoſt Projection of the *ſmall Guts*, under the ſame Circumſtance of *Inflation*, meaſured about Six Inches; the greateſt *Diameter* that the *Colon* in this Circular Figure made, was ſomewhat above Seven Inches.

In the whole *Duct* or *Canalis* of the *Inteſtines*, I could not obſerve any *Valves*; no not at the *Cæcum* its ſelf. 'Tis true, that the *Foramen* into the *Cæcum*, was a great deal leſs than the Capacity of the *Gut* its ſelf; however, the Paſſage into it was ſo *open* and *wide*, as readily to receive or emit its Contents. For by pouring a large Quantity of Water into the *Stomach*, ſo as to waſh out the *Fæces* contained in the *Inteſtines*; I found, that it would firſt run into the *Cæcum*, if it was not filled before, and then into the *Colon*, and as readily, upon elevating the *Colon*, it would paſs thence, firſt into the *Cæcum*; and, when that was filled, into the *Ileon*.

Paſſing by other *Remarks* which I might make upon the *Glands* in the Inward Coat of the *Inteſtines*, upon the *Blood-Veſſels* in the *Meſenteries*, *&c.* I ſhall now proceed to give my Thoughts upon the whole Structure and Figure of the *Inteſtines*, and how advantageouſly they are contrived for the *Uſes* deſigned them by Nature.

For

For *First*, by means of these frequent *Gyrations* and windings of the *Inteſtines*, there is a greater Opportunity given to the *Separation* of the *Chyle* into the *Vaſa Chylifera*; for the *Bore* of the *Inteſtines* being ſo large (as I have ſhewn) and there being no *Valves* in all their length; if there was not this Contrivance to give a *Lett*, or *Remora* to the haſty Deſcent of the *Fæces*, they would paſs off ſo nimbly, that with them a great part of the *Chymous* Subſtance likewiſe, would be carried off: But the Length of the *Inteſtines* here, being ſo great; and as they run, making ſo many *Convolutions*, they do prevent this Danger.

Secondly, By means of this *Cochlea*, or *Spiral* Figure of the *firſt Meſenterie*, to which the *ſmall* Guts are affixed, there may be prevented a *Regurgitation* of the Contents of the *Inteſtines* again into the Stomach, upon a Declivity of the Body of this Animal, as it is frequently in, when it hangs by its *Tail*. For tho', as I obſerved, the *Paſſage* from the *Stomach*, by the *Pylorus*, into the *Duodenum*, is large and open; yet in this Poſture of the Body, there can't but be a *Reduplication*, or folding over of the *Duodenum*; ſince the great *Bulk* or Wallet of theſe *Inteſtines* muſt incline and ſwag towards the *Diaphragm*; by which *Reduplication*, the *Paſſage* at the *Pylorus* muſt, in a great meaſure, be occluded; and the *aſcent* of the Contents now, be altogether as difficult and great, as when the Animal ſtands upon its Four Feet.

The *Reverſe* of this Structure of the *Inteſtines* I found and have deſcribed in my Anatomy (*cc*) of the *Tajacu*, or the *Mexico* Musk *Hog*: for here the *Colon* made a *Spiral* Figure (as I have there repreſented, in *Tab.* 1. *Fig.* 5.) and the *ſmall Guts* made a Plain. In our *Poſſum* the *ſmall Guts* makes a *Spiral*, and the *Colon* and *great Guts* a Plain. But a *Spiral Convolution* of the *Inteſtines*

is to be met with in ſeveral Animals, tho' their Structure be different; as in the *Goat* and *Deer Kind*; and very remarkably in a *Woodcock*.

But we will have done with the *Guts*, to proceed to other *Parts*; for their *Comparative Anatomy* is too large a Field, and would be too great a *Digreſſion*, to engage in the Deſcription of them in a *ſingle* Subject.

The *Pancreas* was large, having one part (if I mis-remember not) running towards the *Spleen*, and the other down by the *Duodenum*.

The *Spleen* was Two Inches and half long, and One Inch in the broadeſt Part, and was of a dark Red Colour.

The *Liver* in this Animal was very large, of a bright Red Colour, conſiſting of Three *Lobes* †; Two of them were much larger than the third, which lay out of ſight, and was not to be ſeen, but upon inverting the *Liver*: and here we found not only at the Edges of one of the larger *Lobes*, deep *Inciſures* *, which rendered it jagged; but alſo in the middle of the *Concave* part of the ſame *Lobe*, ſeveral deep *Fiſſures* †: Poſſibly for this Reaſon, that ſo it might yield and give way the better when 'tis inverted, as 'tis always, when this Animal hangs by its *Tail*. The *Bladder* * of *Gall* here was very large. The Situation of the *Liver* and *Spleen* here, appeared as in other Animals.

† *Tab.* 2. *Fig.* 5. *B B B.*

* *e e e*

† *d d d.*

* *c.*

In the *Urinary Parts* I did not obſerve any thing peculiar or different from the uſual Structure, unleſs what we ſhall remarke of the *Bladder* of *Urine*. The *Kidneys* || of each ſide were a little above an Inch and half long, about three quarters of an Inch broad, and of the Figure almoſt of a Kidney-Bean. The *Emulgent* † Veins and Arteries * were very plainly ſeen: But on the inſide of the *Kidneys*, towards the upper Part, were placed the *Glandulæ Renales* ||, or *Renes Succenturiati*, as they are called by ſome,

|| *Tab.* 2. *Fig.* 2. *AA.*

† *b b.*

* *c c.*

|| *D D.*

ſome, and which were here very large, and of the ſame Colour with the *Kidneys* themſelves, which was a deep Red; whereas theſe *Glandulæ Renales* in *Men* and other *Animals*, are uſually of a White, Yellowiſh Colour.

* *e e.* The *Vreters* * were about five Inches and an half long, and were inſerted into the Neck of the *Bladder* of *Urine*,

‖ *f.* as is repreſented ‖, firſt running under, then aſcending up by the two Extreams of each *Uterus*, as they lie duplicated.

† *G.* The *Bladder* † of *Urine*, being inflated, was about the Bigneſs of a Hen's Egg and of that Figure. The

* *h.* Neck of the *Bladder*, or *Vrethra**, (which was about an

† *i i.* Inch long) lay over the *Vaginæ Vteri* †; and here the *Vrethra* and the *Vaginæ Vteri* emptied themſelves into

* *K.* one *common Canalis* * or *Paſſage*, which meaſured about an Inch and half in length.

In moſt Animals, about the *Kidneys* there uſes to be obſerved a large Body of *Fat* covering them, being contained in the *Membrana Adipoſa*: But here we found four large protuberant *Lumps* of *Fat*, two of each ſide; two of them lying in the *Pelvis* of the *Abdomen*, near the *Bladder* of Urine, and the *Vterine* Parts; and the two others, between them and the *Kidneys*. Upon Examination, I found that they conſiſted of regular large *Laminæ*; which were eaſily ſeparable from one another, in broad Fleaks; ſo as I have not obſerved before; and indeed, before I had examined theſe Lumps of *Fat*, I could not tell well what to make of them; and I am apt to think, that theſe Two Bodies of *Fat*, near the *Vterus* are, what *Margrave* (*a*) and *Piſo* (*b*) calls, *Teſtes ſub Ano interiùs jacentes*; for, as I ſhall ſhew from themſelves, in the *Male*, the *Teſtes* are otherwiſe placed.

We ſhall proceed now to the Examination of the *Vterine Parts*: For 'tis ſo far from *Truth*, what is aſſerted by ſome, that it has no *Vterus* within, that here we find not only one, but two *Vteri*; and theſe too moſt

wonderfully contrived, and far different from the common Structure and Make of this *Part*, in other Animals. And the more too I wonder at this Miſtake, ſince they pretended to have diſſected them; for ſo *Margrave* (*a*), *Hæc Burſa* (ſpeaking of the *Marſupium* or *Pouch*) *ipſe Uterus eſt Animalis; nam alium non habet, uti ex ſectione illius Comperi; in hac ſemen concipitur, & catuli formantur.* And ſo *Piſo* (*b*), *Ex reiteratis horum Animalium Sectionibus, alium non invenimus Uterum præter hanc Burſam; in qua ſemen concipitur & Catuli formantur.* But notwithſtanding what they talk of their *diſſecting* them, there is not one Obſervation (as I know) of any one of the inward *Parts*, that they have given us. *Hernandez* (*c*) is more in the Right (and indeed his *Account* is much more to be valued, and more faithful in the whole, than any of the others) where he tells us, *Quaternos, quinoſve parit Catulos, quos utero conceptos, editoſq; in Lucem, Alvi capacitate quadam, dum adhuc parvuli ſunt, claudit & ſervat.* We will therefore here take a Survey, and an Account of theſe *Parts*; and we find, that there are two *Ovaria*, two *Tubæ Fallopianæ*, two *Cornua Uteri*, two *Uteri*, and two *Vaginæ Uteri.*

The *Ovaria* ‖ were placed one of each ſide, near the Extreams of the *Cornua Uteri*, being faſtened to the *Alæ Uteri*, and were about the Bigneſs of a *Velch.* The *Vaſa Præparantia* (the *Arterie* † and the *Venie* ‖ that did go to and from them) were very plain, and as I have repreſented them; though the greateſt part of theſe *Veſſels* were beſtowed upon the *Cornua Uteri.* Near the *Ovaria*, I obſerved the *Fimbriæ* ‖ *Foliaceæ*, and thence a Paſſage into the *Tubæ Fallopianæ* *. The *Tubæ Fallopianæ* * were two fine ſlender *Canales* or *Ducts*, ſupported by the *Alæ Uteri*, and running waving, and led into the Extreams of the *Cornua Uteri.* The *Cornua* † *Uteri*, being inflated, were about the Bigneſs of a Gooſe Quill, about an Inch

‖ *ſſ.* ** *rrr.* † *nnn.* ‖ *oooo.* ‖ *Tab.* 2. *Fig.* 3. *b.b.* * *Fig.* 3. *cc.* *Fig.* 2. *tt.* † *Fig.* 3. *d d.* *Fig.* 2. *uu. ww.*

Inch and half long, and were faſtened to the *Alæ Uteri*, towards both Ends a little crooked, but where they paſs into the *Uteri*, they were reflected inwards; at the other Extream reflected outwards. Their Subſtance ſeemed rather thicker than the *Uteri* themſelves, and not ſo tranſparent, by reaſon of the numerous *Blood-Veſſels* which irrigated them almoſt all over; for in the inſide, both above and under, there ran the whole length of the *Cornua*, large Trunks of *Blood-Veſſels*, ſending from the Sides all along numerous Branches; which is very requiſite: For in Animals that are *Multiparous*, as is our Subject, the *Litter* or *Fætus* do lie, and are formed in the *Cornua Uteri*. And I did here take Notice of ſome little Riſings of the inward Membrane of the *Cornua*, whereby they were ſomewhat divided into *Cells*; but very imperfectly: However, for the Nouriſhment and Formation of the *Embrio's* here, ſo great a Number of *Blood-Veſſels* is highly neceſſary; and they were far more numerous here, than in the *Uteri* themſelves. It has Four or Five *Young* Ones at a time, ſaith *Hernandez* (*c*). *Piſo* (*b*) and *Joh. Stadius* ſaith, Five or Six. That which *Margrave* (*a*) obſerved, had Six. *Ralph Hamor* (*l*) and *Cardan* ſays, it has Seven. So *Joh. de Laet* ſaith Six or Seven. But *Jul. Cæſ. Scaliger* (*r*) out-reckons them all; for he ſaith, *Fæcundiſſima eſt, duodenos parit exiguos*: But this Account I do ſuſpect.

Theſe Two *Cornua* do empty themſelves into the Two *Uteri* *, juſt in the Middle, where they are conjoined together; and ſo outwardly ſeem to form, but as it were, one continued Body †; from this Conjunction, near the Neck of the *Bladder*, extending themſelves on each ſide, and afterwards, being reflected to the Neck of the *Bladder* again, where they paſs into the *Vaginæ Uteri*. But having extended this Part by Inflation, and ſo letting it dry, and then diſſecting it; I obſerved a

* *Fig.* 3. *e e.*
Fig. 2. *x x.*
†*Fig.*3. *e e.*

Mem-

Membrane ‖ like a *Diaphragm*, perfectly to run cross, and entirely to divide them, near the insertion of the *Cornua*, into two distinct Bodies; so that what is contained in the *Uterus* on the Right Side, can't pass into the *Uterus* on the Left Side, by means of this *Partition* Wall; tho' outwardly (as I said) they both seemed, but as one continued Body. ‖ *Fig.* 2. *y.*

I must confess, the Fabrick of this *Part*, seemed very surprising to me; and such as I have not met with a *Parallel*, or the like, in any *Animal* besides; at least of the *Quadrupede* Kind. 'Tis true, in *Lobsters* and *Crabs*, in the *Female* there are two *Uteri*, as in the *Male* there are two *Penes*, but more distinct and separated from one another. So two *Penes*, and each forked too, I have observed in the *Rattle-Snake* (*uu*); but how the *Male Possum* is provided, I cannot tell: But this I think is the *only Instance* of a *Land Quadrupede*, that has two *Uteri*; and each of these too, seemingly *double*, by that Reflection they make, and by an imperfect *Diaphragm*, which divides the Cavity of each *Uterus* a considerable way, as we shall shew.

These *Uteri* are not fastened to the *Alæ*, as are the *Ovaria*, *Tubæ* and *Cornua*; but where they are conjoin'd near the Insertion of the *Cornua*, they do adhere very firmly to the Neck * of the *Bladder*, not easily to be separated thence; and by Membranes to the *Rectum*; where more separable. So that the Neck of the *Bladder* lies over that *Diaphragm* or Membrane which parted them (as I said) into two distinct *Uteri*. Here the Body of the *Uteri* seemed to be about the Bigness of the End of my Finger; or in Compass (thus inflated) it measured about an Inch and three quarters: Hence they * *Fig.* 3. *l l.*

(*uu*) Philosoph. Transact. *No.* 144.

were

were projected towards each side, and not according to the Length of the *Spine*, gradually inlarging the inward Cavity, as 'tis extended. For here about the *Angle* of *Reflection*, it measured in Compass two Inches and an Half. The *Uteri* being thus extended towards each side about the Space of an Inch and three quarters; and then
† *Fig.* 3. *e e.* reflected † back again, towards the Neck of the *Bladder*; and so pass into the two *Vaginæ* ||, which lies under the
|| *Fig.* 2. *i i.* * *h.* *Urethra* *. From this *Angle* of *Reflection*, the Cavity of each *Uterus* gradually lessens, and is much smaller than the other part of the *Uterus*. The Capacity of each *Uterus* being the largest at the outward Elbow, where it begins to be reflected; for here it made, as 'twere, one *Common* Cavity, for almost the length of an Inch: But
† *z.* on the inside, I observed a *Membrane* † to be projected from the internal side of the *Uteri*, just from the Corner where the sides of the *Uteri* are doubled, whereby this Cavity is in part divided; and for this Reason, shall call this *Membrane*, the *Second*, or an imperfect *Diaphragm* of the *Uteri*.

Here in these *Uteri*, I observed Four large Trunks of *Blood-Vessels*, which did run the whole length of them, sending from their sides numerous Branches, and Ramifications all along. These Trunks were propagated from
|| *p p p.* * *n n n.* *o o o.* the *Hypogastrick* || and *Spermatic* * Vessels. I did also here observe in these *Uteri* (thus by Inflation extended and dried) several *Fasciculi* of *Muscular* Fibres, placed at a regular Distance from one another; which did run the whole Length of the *Uteri* likewise: by means of whose Contraction, the *Fætus* may be more easily forced out.

These two *Uteri* (as I mentioned) empty themselves
† *i i. Fig.* 3. *f.* into the two *Vaginæ* †; for at this Extream, the *Uteri*, making a turn at the Neck of the *Bladder*, are continued thence into the two *Vaginæ*, which lie just under the

the *Urethra**, or that *Paſſage* or Pipe which conveys the *Urine* from the *Bladder*, and are much of the ſame Length with that of the *Urethra*, which was about an Inch. Their Capacity was about the Bigneſs of a Wheat-Straw. Both theſe *Vaginæ* and *Urethra* too, emptied themſelves into a *Common Paſſage* ‖, or *Canalis*, which was as large as all the other Three; and about an Inch and half long: it looked Rediſh, by means of the numerous *Blood-Veſſels* it enjoyed, and at laſt had its *Exit* ſo near the *Fundament*, that when alive, there was not obſerved any other *Foramen* outwardly, but that which led into the *Rectum*. But when I came to diſſect it, by elevating the *Skin* here, which ſeemed to cover it, like a *Valve*; I obſerved the *Foramen* that led into this *Common Paſſage*, and putting a *Blow-pipe* into it, at the ſame time, by Inflation I extended the *Bladder* of *Urine*, and the *Uterine* Parts too; *viz.* The *Vaginæ*, the *Uteri*, and the *Cornua*. So that in the *Skin* here, there was only one *Foramen* † for the *Exit* of the *Fæces*, and the *Urine* and the *Fætus* too.

* Fig. 2. *b*.

‖ *K*.

† † Tab. 1. Fig. 3. *C*.

I have had no Opportunity of diſſecting a *Male Poſſum*; and indeed, of none other but this *ſingle* Subject: For had I, I might have been more exact in ſome Particulars; nor is it almoſt poſſible, to obſerve all in *One*.

The Account they give of the *Male*, is but very imperfect and ſhort: *Mas Fœminæ per omnia ſimilis, benè teſticulatus*, ſaith *Margrave* (*a*) *In Burſa pendulos Teſtes, more Gati, gerens*. And much the ſame, ſaith *Piſo* (*b*), *Mas Fœmellæ planè ſimilis, in Burſa pendulos, more Gati, teſticulos fert*: But adds, *Et quod notatu dignum, Manticam* (*licet à Fœmellæ diverſam*) *habet quâ alternatis vicibus Catulos quoque circumfert*. I could wiſh he had given us, wherein 'twas different; and what kind of *Penis* the *Male* had.

The

The Ingenious and moſt Learned Mr. *Ray* (*o*) *Queries*, Whether the *Tai-ibi* of *Braſile*, deſcribed by *Margrave* (*a*); differs from our Subject, the *Poſſum*, only in Sex? Or, Whether 'tis another *Species* of Animal? And indeed, by a Paſſage in his Deſcription of it, one would think, that *Margrave* did take the *Tai-ibi* to be only the *Male*. I will tranſcribe the whole *Paragraph*, it not being very long, that every one may have the Liberty of making their own Conjectures. Tai-ibi *Braſilienſibus*,(ſaith he) *Luſitanis* Chachorro do mato, *Belgis* een Boſchratte: *Animal corpore tereti & oblongo. Totius corporis cum collo longitudo ab occipitio ad caudæ initium quatuordecim digitorum, craſſities decem. Caput habet vulpino æmulum, ore acuto, barba felina: oculos conſpicuos & prominentes, nigros: aures ſubrotundas, molles, graciles, albas, teneras ut charta mollis. Crura, pedes & digitos cum unguibus habet ut fœmella jam deſcripta, uti & caudam. Totum corpus veſtitum eſt pilis albis ſplendentibus, qui in extremitatibus nigricant, & magis quidem in dorſo, maxime tamen in cruribus: circa anum & initium caudæ pene nigricant. Os & aures albicant. Cauda in exortu ad quinque digitorum longitudinem pilis veſtitur albis in extremitate nigricantibus, reliqua pars major ad finem uſque cincta eſt corio tenui ſquamoſo albicante inſtar exuviarum ſerpentis. Fœtet graviter, caro tamen illius comeditur. Victitat libenter gallinis, ut vulpes. Pili inſerti ſunt tenui cuticulæ, quæ detrahi poteſt ſalvo manente corio craſſiori. Teſticulos propendentes habet ut felis mas.* Had *Margrave* mentioned in his Deſcription, the *Marſupium* or *Pouch*, it had been more clear; but by the Account he gives, one cannot but think, that he makes the *Carigueya*, the *Female*, and the *Tai-ibi* the *Male* of the ſame *Species* of Animal. As they eat the *Tai-ibi*, ſo *Ralph Hamor* (*l*) tells us, that he has eaten the *Poſſum*, and that 'tis a grateful and wholeſom *Food*.

Piſo (*b*) having concluded his Deſcription of the *Carigueya*, adds, *In Indiis Orientalibus, idq; ſolum quantum hactenus conſtat in* Amboina, *ſimilis Beſtia frequens ad Fælis magnitudinem accedens, mactata ab incolis comeditur, ſi rite preparetur, nam aliàs fætet. Nomen illi* Cous Cous *inditum.* What Similitude this Beaſt may have with our Animal; or whether it is to be reckoned amongſt the *Animalia Crumenata*, as *Scaliger* (*r*) calls them, I do not know. Our Animal ſeems to be properly a *Native* of *America. Richardus Dinothus* (as I find him quoted in *Aldrovandus* (*a*) ſaith *Veram horum Patriam Americam eſſe, præſertim Pervanis Regionibus.* So *Peter Martyr* (*w*), *Arbores in Pariana Regione ingentes ſunt, inter quas repertum eſt animal*, &c. and then deſcribes our *Poſſum.* That 'tis found in *Darien* and *Florida*, is aſſerted by *Nierembergius* (*d*); and in *New-Spain*, by *Cardan*, and others. That they are in the Iſles of *Anguilla* and *Tabago*, is affirmed by the *Author* of the *Preſent State* of his Majeſty's Iſles and Territories in *America*, *pag.* 138, and *pag.* 250. And in *Virginia* they are frequently to be met with; as *Ralph Hamor* (*l*), *John de Laet* (*m*), Captain *John Smith* (*n*), and a great many others, tells us; and this that we diſſected came from thence.

But not only in the *Weſt*, but *South America* likewiſe, 'tis to be found: So *Petrus Maffeius* (*e*) and *Caſpar Barlæus* (*f*) aſſures us, that they are in *Braſile.* Whether *Cardan* (*i*) was not mis-informed, when he tells us, that 'tis in *Æthiopia*; I do very much queſtion; his Words are theſe: *Animal aliud mittit Æthiopia, parte anteriori vulpi perſimile, Cauda & poſteriore Cercopitheco, pedibus anterioribus humanis, auribus veſpertilionis, quod crumenam habet ſub Ventre, qua Catulos undiquaq; gerit nec dimittit, niſi dum lactare vult.* What Authority he had for this, I do not know; but he owns too, that

that they are in the *West-Indies*. *Nierembergius* (*d*) amongst the *Places* where this Animal is to be found, reckons likewise the *Molucca Islands*; which, if true, there may be something in what *Piso* (*b*) saith of *Amboina*, which is one of them. But I think it does deserve a farther Enquiry.

I shall proceed now to give a Description of the *Sceleton*, and so shall conclude.

We will begin therefore with the *Head*, which, from the End of the *Occiput*, to the Extream of the *Nares*, was Four Inches and Three Quarters long; of which † *Tab.* 1. *Fig.* 4. *AA.* the *Rostrum* † measured Three Inches; and just where ‖ *b b* the *Rostrum* and the *Cranium* ‖ met, the Bones were so pinched in, at the Sides, that here, 'twas very narrow; and I may say, in Proportion to the Bulk of the Animal, this was the least *Cranium* that ever I met with in a *Quadrupede*. On the *Forehead*, the *Rostrum* was an * *i.* Inch broad, having on each side, a *Protuberance** jutting † *K.* out. There was a large *Sature* † just in the Middle, which divided the upper Bones of the *Nares* lengthways, and though they ran slender towards the Extream of the *Nares*; yet these Bones towards the *Forehead*, spread into a *Triangular* Figure, and as they are joined together, they form a *Rhomboide*, or a *Lozinge*. But I will not be particular in describing each *Bone*, that compose the *Head*; for fear of being tedious: But I cannot but ‖ *c c c.* take notice of that remarkable rising *Ridge* ‖ like a *Crest*, that runs the length of the *Cranium*, from the *Forehead* to the *Occiput*, just in the Middle; where the *Sutura Sagittalis* is in other *Skuls*. This *Ridge*, for Distinction sake, I shall call, *Protuberantia Ossea longitudinalis*; and I observed, it jutted out from the *Cranium*, above a Quarter of an Inch: Just at its upper *Edge*, I could perceive a *Seam* like a *Suture*; so that though now, these

Bones are ſo well united together, that they appeared as one entire Body; yet in the *Fætus*, without doubt, they are ſeparable, and are Two. And this I rather think, becauſe in the upper part of the *Cranium* I could not find any *Sutures* at all. So likewiſe anſwerable to the *Lamdoidal Suture*, may be thoſe other *Ridges* in the Extream of the *Occiput*, which I ſhall call, *Protuberantiæ Oſſeæ Laterales* *; which ariſing on each ſide from the *Proceſſus Styloides*, aſcends obliquely up the hinder Part of the *Occiput*; and juſt in the Middle at the Top, is joined with the *Longitudinal Ridge*, I have deſcribed. Theſe *Ridges*, although as deep as the *firſt*, yet were not ſtanding ſo upright, but projected rather like a *Penthouſe*, over this hinder part of the *Cranium*; by both which *Ridges*, the *Cranium* is ſo well guarded and defended, that 'tis almoſt impoſſible, the *Skull* ſhould be any ways cracked or broken. Something like theſe *Ridges*, but nothing ſo large, I have obſerved in the *Skull* of a Weaſel. * d.

And not only the *Brain*, but the *Eyes* likewiſe, are very well guarded and defended, by the *Os Zygomaticum* †; which is very broad and ſtrong; in the broadeſt Place being above Three Quarters of an Inch, and in the narroweſt Half an Inch, being very thick on its under Edge; but at its upper, growing thin and ſharp. But for the greater Strengthening this *Bone* (which is formed by a *Proceſs* from the *Os Temporum* ||, and another from the *Maxilla ſuperior* *) where they meet, they lap over one another, and ſo become the ſtronger. This *Os Zygomaticum* was Two Inches and an Half long, and ſtanding off from the *Cranium* an Inch in Diſtance. † e. f. || e. * f.

In the *Orbit* of the *Eye* at the inward *Canthus*, there was a large *Foramen* †, which led into the Cavity of the *Noſe*, and by a *Duct* placed here, the *Tears* or Moiſture from the *Eyes* is conveyed into the *Noſtrils*. In the upper † g.

‖ *h.* per *Jaw-Bone* likewiſe, there was a large *Foramen* ‖, which was for the Paſſage of ſome Veſſels from the inward *Orbit* of the *Eye.*

† *b b.* The *Cranium* †, which encompaſs'd the *Brain*, in the largeſt Place, was about an Inch over; and about an Inch and Half in Length; but its Cavity jutted out ſomewhat farther towards the *Nares*, making as it were, a particular *Cell* here, and pretty capacious, for the receiving the *Proceſſus Mamillares*, and that fore Part of the *Brain.* And afterwards I obſerved the *Os Cribriforme* very remarkably perforated with Holes, like a *Sive*; and indeed, in forming this *Organ* of *Smelling*, Nature ſeems very careful and ſollicitous, the *Roſtrum* making ſo great a part of the *Head*, that the *Cranium* it ſelf ſeemed very inconſiderable in reſpect to it, its inward Capacity containing not above the Quantity of a *Walnut.* Not having diſſected the *Brain* (which I hope I may have hereafter an Opportunity to do) I will not at preſent, inſiſt on the Deſcription of the ſeveral *Foramina's* I obſerved on the inſide, for the Paſſage of the *Nerves* and *Blood Veſſels.* But, as I have ſhewn, ſince it has ſo little *Brains*, *Nature* hath been very kind to it, in preſerving them, by the Defence of thoſe *Prominent Bones* I have remarked, both length-ways and laterally behind; and on the Sides too, 'tis guarded by the *Temporal Proceſs* † *e.* † of the *Os Zygomaticum.*

The *Os Spongioſum* in each *Noſtril*, ſeemed very curiouſly contrived, by the abundance of *Laminæ* it enjoys; ſo that the *Membrane* that covers them, by this means, is render'd more Capacious, and capable of receiving more plentifully the *Effluvia's* of thoſe Animals, it would either catch, or avoid; and in this *Senſory* 'tis known, that *Bruits* excel even *Man* himſelf, and their *Organ* is more adapted for it.

The

The *Under-Jaw* || consisted of Two strong *Bones*, join- || *l l.*
ed together only at the *Mentum*; each measured Four Inches in Length. The *Head* of this *Bone* (which was Half an Inch broad) was received into a *Sinus* of the *Os Temporum*, and very firmly articulated there. It had Two *Processus*: the *Anterior* † or *Superior* is large and † *m.*
thin, into which is inserted the *Temporal Muscle*. The *Inferior* * *Process* is smaller, and runs to a sharp Point: * *n.*
Here at this *Process*, the Edge of the *Mandible* is so dilated, that it measured above Half an Inch. On the inside of the *Jaw* here, is a large *Sinus*, which leads to a *Foramen* that goes into the Body of the *Jaw-Bone*, and affords a Passage for the Vessels thither.

The Use of these *Bones* is for *Mastication*; which leads me to consider the *Teeth*. And here we find all the Three Sorts of them; for in the *Upper-Jaw* before, were Eight small *Dentes Incisores*, Four of each Side; then a void Space, almost a Quarter of an Inch; then Two large *Prominent Dentes Canini*, one of each Side; which jutted out of the *Jaw* about Half an Inch: these were succeeded of each Side, with Three *Dentes Incisores*; but these were much stronger and larger than the *Fore-Teeth*; and these imitated the *Dentes Molares*, in that they were inserted into the *Jaw-Bone* with Two *Phangs*: But the *Heads* of these *Incisores* were acuminated; whereas the *Heads* of the *Molares* were flat, and almost of a *Triangular* Figure. There were Four *Dentes Molares* of each Side: in all, Four and Twenty Teeth in the *Upper-Jaw*. But the double *Phangs* of the *Molares*, and the *Incisores Majores* were such, as at first sight, one would think them Two distinct *Teeth*; each *Phang* being inserted into a distinct *Alveolus*, or *Socket* in the *Jaw*, and remaining separated some way above the *Jaw-Bone*, and only joined at the *Head*.

In

In the Under *Jaw-Bone*, there were likewiſe of each Side, Four *Dentes Inciſores Minores* before; then a little void Space; after that, the *Dens Caninus*; then Three *Dentes Inciſores Majores*; and laſt of all Four *Dentes Molares*, anſwerable to thoſe in the *Upper-Jaw*, but ſomewhat ſmaller. In both *Jaws* in all, Eight and Forty *Teeth*. *Georg. Margravius*'s (*a*) Account I find is ſomewhat different from mine; for he ſaith, *Dentes (habet) inſtar fælis ſeu Vulpis, anterius nimirum tam ſuperius, quàm inferius parvulos, hinc quatuor longos Caninos, ſuperiores quidem longiores, inferiores breviores, hinc iterum ſex alios, & dein Molares. Nimirum ſedecim Molares, duodecim inter medios, quatuor Caninos, & inciſores parvulos in inferiori mandibula octo, in ſuperiori decem, nam duos majuſculos in medio habet, more Leporis.*

But we will proceed next to what the *Head* is faſtened to, the *Vertebræ*: and I find here, Seven *Vertebræ* of the *Neck*; Thirteen of the *Back* or *Thorax*; Six of the *Loins*; Three of the *Os Sacrum*; and Two and Twenty of the *Tail*; One and Fifty in all, and all extraordinarily contrived.

† *No.* 1. The Firſt *Vertebra* † of the *Neck* (to which the *Head* is faſtened, and is therefore called the *Atlas*) had Two broad *tranſverſe Proceſſes*, but no *Spine*. The Second * 2. *Vertebra* * of the *Neck*, had a very large and thick ‖ *Tab.* 2. *Fig.* 6. *b.* *Spine* ‖ of a Triangular Figure; and in it was obſerved a * *c.* large Semi-circular *Sinus* *, which was ſo deep, as to receive into its *Boſom*, a great part of the Firſt *Vertebra*; by which means, the *Articulation* was very much ſtrengthened. This *Vertebra* is called *Dentata*, from that † *d.* *Tooth like Protuberance* † I have repreſented, and which is received into the Hollow of the Firſt *Vertebra*, where the *Medulla Spinalis* runs. This *Vertebra* backwards, * *e.* had Two *Proceſſus obliqui ſuperiores* *, and Two *Oliqui* † *f.* *inferiores* †. The Third *Vertebra* of the *Neck*, had the ſame

ſame *Proceſſes* || both before and behind; but the *Spine* * here was about Three Quarters of an *Inch* in Height; about the Third of an Inch thick; and juſt at the Top ſeemed to be a little cleft. The *Fourth* and the *Fifth Vertebra* had the ſame *Proceſſes*, as the *Third Vertebra*; and the *Spine* here, likewiſe very thick, and cleft at the Top; but gradually leſſening in Height, as alſo Thickneſs. The *Sixth Vertebra*, beſides the former *Proceſſes*, had likewiſe an acute *Tranſverſe* one, on each Side; and its *Spine* much ſhorter, and more acuminated than the former. The *Seventh Vertebra* of the Neck had only Two *oblique Proceſſes* before, and none behind; and Two *acute tranſverſe Proceſſes*, and a very ſhort and ſharp *Spine*: So that upon holding up the *Head*, the *Spine* of the *Firſt Vertebra* † of the *Thorax*, would touch the Top of the *Fifth Vertebra* of the *Neck*. Theſe *Vertebræ* are ſo ſtrongly and cloſely locked into one another, that though each of them are large in themſelves; yet, thus articulated, they do not make full Two Inches in Length. But What I moſt wondered at, was, to obſerve the Thickneſs and Strength of the *Spines* of the Second, Third, Fourth and Fifth *Vertebræ*, far different from what I have obſerved in any other Animal; and can't but think muſt be, for the better defending its ſelf from the Injuries it might receive by any Fall; and to perform much the ſame *Office*, as that *Prominent Bony Ridge* in the *Cranium*. And not only here, but likewiſe the *Spines* of ſeveral of the *Vertebræ* of the *Thorax* and *Loins*, I find are thus flatted, and broad at the Ends; and they being ſo, ſhould it happen to fall to the Ground, by Chance or Deſign; theſe *Spines* being ſo Prominent and flat, will better bare off the Blow; and upon this Account, there is no Danger of his breaking his *Neck*, his *Back*, or his *Head*; ſince they are all Three ſo well ſecured and guarded.

|| *Fig.* 7. * *e. e. f. f.* + *d.*

† *Tab.* 1. *Fig.* 4. *No.* 8.

The

The firſt *Seven Vertebræ* of the *Thorax*, have Two † *Tab.* 2. *oblique Proceſſes* † forwards, which run under the *Fig.* 8. *b b.* hinder *oblique Proceſſes* of the preceding *Vertebra*; and * *c c.* have Two *oblique Proceſſes* * backwards, which rides over thoſe of the ſucceeding *Vertebra*; as likewiſe Two † *d d.* *tranſverſe Proceſſes* †, which at their Ends have ſmall ‖ *e e.* *Acetabula's* ‖ or *Sinus's*, for the receiving the *Heads* of * *a.* the *Ribs*, which are faſtened to them. The *Spines* * of theſe *Vertebræ*, are ſlender, thin, and ſharp; about Three Quarters of an Inch long. The *Six* following *Vertebræ* of the *Thorax*, have ſhort, thick, and flat *Spines*. The *oblique Proceſſes* being continued on each Side of the *Spine*, make as 'twere, a Gutter; and the *tranſverſe Proceſſes* here, are ſomewhat different from ‖ *Tab.* 2. the former. The *Spines* ‖ of the *Vertebræ* of the *Back* *Fig.* 9. or *Loins*, the more they approached the *Os Sacrum*, ſo they leſſened gradually in their Thickneſs on the Edge. † *b b. c c.* But here were double *oblique Proceſſes* †, *viz.* Four at each End of the *Vertebra*, and the undermoſt ſpreading * *Tab.* 1. themſelves out broad. The Three *Vertebræ* * of the *Os* *Fig.* 4. *Sacrum*, are firmly faſtened to the *Os Ilium* †; but the *No.* 10. † *No.* 13. laſt not ſo entirely as the Two former: But this at each Side had a broad *tranſverſe Proceß*, and the *Spines* of * *No.* 11. theſe were thin. The Two Firſt *Vertebræ* * of the *Tail* had only *One* ſmall acute *Spine*; but in all the other *Vertebræ* of the *Tail*, both at the Head and Tail of each *Vertebra*, I obſerved Two *Spines*; but thoſe at the Head of the Joint, the larger. In the Six Firſt *Vertebræ* of the *Tail*, there was, of each Side, a broad *tranſverſe Proceß*, the Length of the *Joint*: In the other *Vertebræ* only at the *Head* and *Tail*, a jutting out at the Sides. The *Vertebræ* about the Middle of the *Tail*, were the longeſt; being there about an Inch long; nearer the Root of the *Tail*, and at the End not ſo long.

But what I was moſt of all pleaſed to ſee, and I think, is a wonderful Piece of *Nature's Mechaniſm*, was, thoſe *Spines* † or *Hooks* placed in a Line, in the Middle of the under Side of the *Vertebræ* of the *Tail*. 'Tis true, the firſt Three *Vertebræ* had none of theſe *Spines*, nor were they neceſſary here, ſince they lay within the Compaſs of the *Oſſa Coxendicis*; but in all the other *Vertebræ*, to the End of the *Tail*, they were to be obſerved; but as they approached the Extream of the *Tail*, they grew leſſer and ſhorter. Theſe *Spines* || (where longeſt) were about a Quarter of an Inch, or ſomewhat more: they were placed juſt at the Articulation of each *Joint*, and, as I ſaid, in the Middle from the Sides; and ſeemed to be articulated, both to the preceding and following *Vertebra*; not being an entire ſolid Body, but ariſing from the *Vertebræ* with Two Legs or *Crura*, become afterwards perfectly united at the Ends. By this means, theſe *Bones* are rendred more firm and ſtrong, and this *Hollow* ** ſerves for the tranſmitting the *Blood-Veſſels* thorough them; and one may obſerve here a *Stria*, or Furrow, all the Length of the *Vertebra*, for the receiving them; whereby they are the better ſecured from Compreſſion, when this Animal hangs by his *Tail*. And for the performing this Office, nothing, I think, could be more advantageouſly contrived: For when the *Tail* is twirl'd or wound about a Stick, this *Hook* of the *Spine* eaſily ſuſtains the Weight, and there is but little Labour of the *Muſcles* required, only enough for the bowing or crooking the *Tail*; for then, as by a *Hook*, the Weight of the whole Body is hereby ſuſpended. And for the doing this, 'twas obſerved, that in each preceding *Vertebra*, there did a *Muſcle* ariſe, which was inſerted on each ſide of the ſucceeding *Vertebra*; which Acting or *Contracting*, muſt neceſſarily bend and curve that *Joint*. But for the ſtrengthening the whole, there was obſerved Four *Muſcles*

† *No.* 12. 12.

|| *Tab.* 2. *Fig.* 10. *bbb.*

** *c c.*

to

to arise from the *Os Sacrum*, which did run the whole length of the *Tail*; Two on the upper Side, and Two on the under; sending each a *Tendon* to each *Internode* or *Vertebra*. So that when the *Skin* was stript off, the outward parts of these *Muscles* seemed to have *tendinous* Expansions over them, the whole Length of the *Tail*, and almost to be covered by them; which must needs very much contribute, and add Strength to the *Tail*; besides what may be the Effect of their Insertion of *Tendons* into each *Joint*, or *Vertebra*, in curling and unbending the *Tail*.

What *Use* this Animal makes of his *Tail*, when alive, and how advantagiously 'tis contrived for that Purpose, we have sufficiently seen: But I find it is highly commended by *Hernandez* (*c*), as an extraordinary *Medicine* and *Specifick*; and from him, several others relate the same: I shall give you only his Words, and so proceed on to our *Sceleton*; *Cauda hujus Animalis* (saith he) *egregium est Medicamentum; trita enim drachmæ unius mensura, atq; ex aqua aliquoties devorata, nullo præassumpto alimento eo die quo hauritur, Urinæ meatus mire abstergit, eadem evocata, tractisq; lapillis, & quacunque alia re meatus obstruente. Venerem excitat, generat lac, ac perfractis medetur, & Cholicis, Partum accelerat, Menses elicit, extrahitq; tusa & impositа aculeos qui sunt infixi, ac ventrem emollit.* And concludes, *Et fortassis nullum extat Medicamentum ad has res omnes peragendas, præstantius.*

‖ *Tab.* 2. *Fig.* 4. ****. To the *Vertebræ* of the *Thorax* are fastened the *Ribs* ‖, and there are Thirteen of each Side. The Seven foremost are more perfectly *articulated* with the *Sternum*; the Six succeeding may be reckoned in some Sense, *Costæ Nothæ*: For though they are long, and as they proceed from the *Vertebræ*, are inclined backwards, towards the hinder Legs; yet afterwards they are reflected

forwards towards the *Sternum* or *Cartilago Scutiformis*. But I muſt here take Notice, that though in *Man*, and other Animals, that Part of the *Ribs* that is faſtened to the *Os Pectoris*, or *Sternum*, be uſually *Cartilaginous*; yet here, in our Subject, I obſerved it to be all Bony throughout. However, this Difference I found, that the *Ribs* did look redder, by reaſon of the *Blood-Veſſels* in them; and this Part was Whiter, and where it was faſtened to the *Ribs*, one might plainly ſee; ſo that it may well paſs for a *Bony Cartilage*; as often, the *Cartilages* do become *Bony*. The Firſt *Rib* was only an Inch long, and its Bony *Cartilage* a Quarter of an Inch: hence gradully the *Ribs* increaſe in Length; for the Seventh *Rib* was Three Inches long; and its *Cartilage* One Inch and Half. The Four laſt of the *Coſtæ Nothæ*, gradually leſſen again in Length; for the laſt *Rib* of all was only One Inch and Three Quarters long; and its *Cartilage* did not run Home to the *Os Pectoris*, or *Sternum*, though the Firſt, Second and Third of the *Coſtæ Nothæ* did.

The *Os Pectoris*, or *Sternum*, conſiſted of Seven *Bones*, according to the Number of the *Fore-Ribs*, that are faſtened to them. At the Beginning of the *Sternum*, there jutted out a ſharp *Bony Cartilage*, which, from its Figure, I ſhall call, *Cartilago Enſiformis* †; and here † p.
was faſtened One Extream of the *Claviculæ* ‖; at the End ‖ o.
of the *Sternum*, towards the *Belly*, there was a broad, roundiſh *Cartilage*, which therefore I ſhall call, *Cartilago Scutiformis* *. * ⊙.

There were Two *Claviculæ* ‖, or *Collar-Bones*, each an ‖ o.
Inch and Half long; having one Extream faſtened to the Firſt *Bone* of the *Sternum*, or the *Cartilago Enſiformis*; and the other End to the *Spine* † of the *Scapula*, near † r.
the Conjunction of it to the *Os Humeri*. By means of this *Bone*, it can more advantagiouſly bring its *Fore-Feet*

to

to its *Mouth*; as it uſes to do when it feeds its ſelf, as do the *Monkey Kind*, who have *Claviculæ* too as well as *Man*; though many Animals want theſe *Bones*.

* q. The *Scapula* * or *Shoulder-Blade* was about Two Inches
‖ r. long, about an Inch and Half broad; its *Spine* ‖, though thin, yet the nearer it approached the *Shoulder*, it grew larger and flatter. Into the *Sinus* of the *Neck* of the
† *Tab.* 1. *Fig.* 6. *a.* *Scapula*, was received the *Head* † of the *Shoulder-Bone*, or of the *Fore-Thigh-Bone*; as to that Protuberance, called, the *Acromium*, was faſtened the End of the *Clavicula*.

This *Thigh-Bone* of the *Fore-Legs* I found very re-
‖ *Tab.* 1. *Fig.* 6. markable; ſo that I cauſed a *Figure* ‖ to be made of it: 'twas about Two Inches and Three Quarters long; 'twas
* *b.* thick and Strong, having a large rough *Spine* * jutting forward, and running Half the Length of it. The low-
† *f. g.* er Extream † of this *Thigh-Bone*, to which was faſtened the *Tibia* and *Fibula*, grew very broad, being almoſt an Inch broad. Above, where this Bone began to grow
‖ *e.* broad, on the out-ſide, was a large *Protuberance* ‖; and
* *d.* on the Inſide there was a great oblong *Foramen* *, or hollow Paſſage, formed by a ſmall *Bone* ariſing from the inward Fore-Part of the *Thigh-Bone*, where it begins to grow larger, and was afterwards united to that part of
† *f.* the *Baſis* † of this *Bone*, where the *Fibula*, or *Minus focile* is joined. Juſt in the Middle of the *Baſis* of this
‖ *e.* *Bone*, there was a large *Sinus* ‖ which backwards appeared deeper, which did lock into another deep *Sinus* of the *Tibia*; by which means theſe *Bones* were ſo firmly articulated together, as they were not eaſily, if poſſibly, to be put out of *Joint*.

† T. T. The *Tibia* †, or *Focile majus*, was a ſtrong *Bone*, a-
‖ *V.* bout Three Inches long; which was extended ‖ upwards about a Quarter of an Inch above its Articulation with the *Thigh-Bone*; and at the other End, was faſtened to the outward *Bone* of the *Tarſus*. The

The *Fibula* *, or *Focile Minus*, was a ſmaller *Bone*, placed more inward and forwarder, and not ſo long as the *Tibia*; being articulated above (but not ſo firmly) with the *Thigh-Bone*, and below, with the inward *Bone* of the *Tarſus*. For there were but Two *Bones* of the *Tarſus* †, having each a ſmall *Sinus*, for the receiving the *Heads* of the Two *Fociles*. The *Bones* of the *Metatarſus* ‖ were Four, or it may be Five; to which were joined the Five *Fingers* or *Toes* of the *Fore-Feet*. The innermoſt *Toe* had but Two Articulations, or Joints, but at the End had a large *hooked* ſtrong *Nail*: The other Four *Fingers* had each, Three *Articuli* or *Joints*, armed with *Hooked Nails*, as the Firſt.

* w. w.
† x x.
‖ y y.

The *Hinder-Legs* were faſtened to the Trunk of the Body by the *Os Innominatum*; which, though properly here is but Two *Bones*, (*viz.* One of each Side) being ſeparated above, by the *Os Sacrum*, and below, are joined together at the *Os Pubis*) yet commonly they do, for Diſtinction ſake, give Three Names to each; as the uppermoſt Part of this *Bone* they call, the *Os Ilium* †; the lowermoſt, the *Os Iſchii*, or *Coxendicis* ‖; and the fore Part, where the Coalition is, the *Os Pubis* *. The Length of the whole, in a ſtraight Line, was Three Inches. In the *Os Iſchii* was the *Acetabulum* †, being a large *Socket*, for the receiving the *Head* of the hinder *Thigh Bone*; and deeper in, there was a Space for the faſtening the *Ligament*; from which *Space*, there was a *Sinus* which led outward; ſo that the Brims of the *Acetabulum* was not an entire *Circle*, but broken off here. But the moſt remarkable *Bones* here, are, the *Oſſa Marſupialia* *, *ſeu Janitores Marſupii*, of which I have given a Deſcription before; therefore now ſhall proceed.

† No. 13. Fig. 5. GG.
‖ I I.
* a a.
† f f.
* c c.

The *Hinder-Thigh-Bone* was a little above Three Inches long; 'twas roundiſh, and a ſtrong *Bone*. But the *Tibia* †, or *Majus Focile* of the *Hinder Leg*, was ſomewhat longer

† Tab. 1. Fig. 4. TT.

‖ *w.w.* longer, and a little curved. The *Fibula* ‖, or *Minus Focile*, was about the ſame Length, ſtraighter and ſlenderer: This, towards the *Foot*, was articulated to the *Os Calcis*; as the *Tibia* was to the *Talus*, or *Aſtragalus*; * *x.x.* and theſe Two *Bones* I make the *Tarſus* *; and joining † *y.y.* to them, were the *Bones* of the *Metatarſus* †; and to theſe ‖ *z.* the *Phalanges* ‖ of the *Fingers* or *Toes*. In the innermoſt, or the *Thumb*, there were only Two *Articuli*, or *Bones*; in the other Four *Toes*, or *Digiti*, in each there were Three *Articuli*, or *Joints*. The End of the *Thumb* was more flatted, than the Ends of the other *Toes*: For the *Thumb*, as I have obſerved, had a *flat Nail*, like a *Human Thumb*; in the others, the *Nails* were long, and *curved*. I obſerved likewiſe, at the Articulation of each *Joint* of the *Toes*, on the under Side, there were Two ſmall *Bones*, that are called, *Oſſa Seſamoidea*, and theſe, both in the *Fore* and *Hinder Feet*.

I am ſenſible how *tedious* I have been, in the *Deſcription* of this *one* Animal, and from a *ſingle* Obſervation too. Had I had more Leaſure to have drawn it up in, I might have been much ſhorter. But it being an *Animal*, ſo very remarkable; and one too, *ſui Generis*, or a diſtinct *Species* from all others, I was the more inclin'd to be as particular as I could, though not ſo much as I could have wiſhed. And I am the more confirmed in what I have formerly wiſhed (*ww*) that for the perfecting a *Natural Hiſtory* of *Animals*, we had a *diſtinct* Account and *Anatomy* of ſome *One* of a *Species*; which, with a little Variation, might ſerve for all of that *Family*: ſince I find ſo great a *Maſter* of *Natural Hiſtory*, as Mr. *Ray* (*xx*), is of the ſame Opinion.

(*ww*) *In my Preliminary Diſcourſe concerning Anatomy, and a Natural Hiſtory of Animals, before my* Phocæna. (*xx*) Synopſis Animal. *p.* 324.

Since

Since part of this Diſcourſe was Printed off, I have met with a Paſſage in a *Treatiſe* of the *Bucaniers of America*, wrote firſt in *Dutch* by *John Equemeling*, and ſince tranſlated into *Engliſh* (*yy*), which I can't but take Notice of: And if true, (as the Author aſſures us, that he has ſeen it often) 'tis an Inſtance of a *Quadrupede*, which I knew not of before, that receives its *Young* into its *Belly*. But 'tis not a *Land*, but *Water* Animal; or it may be rather, one *Amphibious*, between both. 'Tis a ſort of *Crocodile*, which he calls a *Cayman*; his Words are theſe, which I therefore repeat, that by farther Obſervation, if true, it might be confirmed; as alſo, it might be more particularly ſpecified, whether their Entrance into the *Belly*, was by the *Mouth*, or any other Part. "Ma- "ny times (ſaith he) their Eggs (for 'tis an Animal Ovi- "parous) are deſtroyed by Birds, that find them out, as "they ſcrape amongſt the Sands: Hereupon the Females "of the *Caymans*, at ſuch times as they fear the coming "of any Flocks of Birds, do oft-times, by Night, ſwallow "theſe their Eggs, and keep them in their Stomach till "the Danger is over. And from time to time, they bu- "ry them again in the Sand, as I have told you, bring- "ing them forth again out of their Belly, till the Seaſon "is come, of being excluded the Shell. At this time, "if the Mother be nigh at hand, they run unto her, "and play with her, as little Whelps would do with their "Dams, ſporting themſelves according to their own "Cuſtom. In this ſort of Sport, they will often times "run in and out of their Mothers *Belly*, even as Rabits "into their Holes. This I have ſeen them do many times, "as I have ſpyed them at play with their Dam, over the "Water, upon the contrary Banks of ſome River: at "which time I have often diſturbed their Sport, by throw- "ing a Stone that way, cauſing them on a ſudden to creep "into the Mother's Bowels, for fear of ſome eminent "Danger. (*yy*) pag. 49.

The

THE
EXPLANATION of the FIGURES.

TABULA PRIMA.

FIGURA PRIMA

Repreſents the outward Shape and Figure of the Poſſum, *drawn from the Life.*

FIGURA SECUNDA

Repreſents the Slit *or* Aperture *in the Belly that goes to the* Marſupium *or* Pouch, *where the Young Ones lodge, till they can ſhift for themſelves.*

FIGURA TERTIA.

A. *Shews the* Marſupium *or* Pouch *turned the inſide outwards, where may be obſerved the Hair or Fur that covers it, and may help the better to keep the Young Ones warm.*

BB. *The two hinder* Legs *cut off.*

C. *The* Foramen *of the* Anus, *which is alſo the common outward Vent or* Exit *to the* Rectum, *the* Bladder *of Urine, and the* Uteri *too.*

D. *The beginning of the* Tail.

FIGURA QUARTA

Gives a View of the Sceleton *or* Bones *of this Animal.*

aa. *The* Roſtrum *or Snout.*

bb. *The* Cranium *or Skull that did contain the* Brain.

ccc. *A Bony* Ridge *or* Protuberantia Oſſea longitudinalis, *that did run the length of the* Cranium, *and over a part of the* Roſtrum.

d. *The lateral* Ridge, *which, like a Penthouſe, jutted over the hinder part of the* Cranium, Protuberantia Oſſea Lateralis.

e.f. *The* Os Zygomaticum. (e) *its* Proceſs *from the* Os Temporum, *and* (f) *that from the* Maxilla Superior, *or* Upper Jaw.

g. *A* Foramen *or Hole in the inward* Canthus *of the* Orbit *of the Eye that leads into the Noſtrils, and by a* Duct *conveys the* Tears *or Moiſture of the* Eyes *into them.*

h. *A* Foramen *or Hole in the upper Jaw for a Paſſage to the Veſſels.*

i. *A Protuberance of the* Os Frontis.

k. *A* Suture *of the* Os Narium.

ll. *The Lower* Mandible *or Jaw-bone.* Maxilla inferior.

m. *The Superior Proceſs of the under Jaw.*

n. *The inferior Proceſs of the under Jaw.*

o. *The* Clavicula *of one Side.*

p. *The* Cartilago Enſiformis *of the firſt Bone of the* Sternum.

q. *The* Scapula *or* Shoulder-Blade *Bone.*

r. *The Spine of the* Scapula.

SSSS. *The* Thigh-Bones *of all the Feet.*

TTTT. *The* Tibia, *or* Focile majus *of all the Feet.*

uu. *Part of the* Tibia *in the Fore-Legs, extended beyond the Articulation.*

ww.ww. *The* Fibula *or* Focile minus *in all the Legs.*

xxxx. *The Bones of the* Tarsus.

yy.yy. *The Bones of the* Metatarsus.

zzzz. *The* Toes.

αα *The* Thumbs *in the hinder Feet.*

No. 1. *The first* Vertebra *of the* Neck *called the* Atlas.

2,3,4,5,6,7. *The second, third, fourth, fifth sixth, and seventh* Vertebra *of the* Neck.

8. *The first* Vertebra *of the* Thorax.

9. *The first* Vertebra *of the* Loins.

10. *The first* Vertebra *of the* Os Sacrum.

11. *The first* Vertebra *of the* Os Coxygis, *or Tail.*

12.12.12.12. *The Spines or Hooks on the inside of the Tail.*

13,14. *The* Os Innominatum, *where* (13.) *is the* Os Ilium, (14) *the* Os Ischii *or* Coxendicis.

15.15. *The* Ossa Marsupialia, *seu* Janitores Marsupii.

****. *The Ribs, thirteen in all.*

⊙. *The* Cartilago Scutiformis.

FIGURA QUINTA

Represents the Situation of the Ossa Marsupialia, *&c.*

aa. *The* Ossa Pubis.

b. *The Coalition or the joining of the* Ossa Pubis.

cc. *The two* Ossa Marsupialia, *or* Janitores Marsupii.

d,e. *The Basis of the* Ossa Marsupialia, *where joined to the* Ossa Pubis, (d) *the inward Head of the* Basis, (e) *the outward.*

f.f. *The* Acetabulum *or* Socket *for receiving the Head of the Thigh Bone.*

g.g. *The* Os Ileum.

hh. *The* Vertebræ *of the* Os sacrum.

ll. *The* Os Ischii *or* Coxendicis.

FIGURA SEXTA

Exhibits the Figure of the fore side of the Thigh *Bone of the fore Leg.*

a. *The Head of the* Thigh Bone, *where 'tis fastened to the* Scapula.

b. *A large rough* Spine, *which runs above half the Length of this* Thigh Bone.

c. *A Protuberance of this Bone on the out side.*

d. *A large* Foramen *or hollow Passage.*

e. *A* Sinus *for receiving the* Head *of the* Tibia.

f,g. *The Basis or lower Extream of the Thigh Bone.*

TABULA SECUNDA.

FIGURA PRIMA

Represents the Stomach *and* Guts, *and the several* Coylings *they make.*

A. *The* Gula *or* Gullet.

B. *The* Stomach.

c. *A*

c. *A Perforation of the* Stomach, *caused by an Ulcer there.*
dd. *The two pouching out of the* Stomach *at the two Ends.*
e. *The* Pylorus.
f. *The beginning of the* Duodenum.
g,h,i,k,l,m,n,o,p,q. *Represents the small* Guts, *and the Coyles and Convolutions they do make. Some of the Coyles lie hid, and out of sight; But the order how they follow one another, is signified by the Order of the Letters of the Alphabet: so that* (g) *follows* (f), *and* (g) *is succeeded by* (i) *and* (i) *by* (k), *and so on to* (q) *where the* Ilion *is discharged and emptied into the* Cæcum; *or, if that is full, into the* Colon *at the first Letter* S.
RR. *The* Cæcum.
SSS. *The* Colon.
T. *The* Rectum.
V. *The first* Mesenterie, *or* Mesenterium minorum Intestinorum
W. *The second* Mesenterie, *or* Mesenterium majorum Intestinorum.

FIGURA SECUNDA
Exhibits the Urinary *and the* Uterine *Parts.*

AA. *The two* Kidneys.
bb. *The* Emulgent Veins.
cc. *The* Emulgent Arteries.
dd. *The* Glandulæ Renales.
ee. *The two* Ureters.
f. *The Insertion of the left* Ureter, *into the Neck of the* Bladder.
G. *The* Bladder *of* Urine *turn'd aside*
h. *The* Urethra.
ii. *The two* Vaginæ Uteri.
K. *The* common Passage *from the* Urethra, *and the two* Vaginæ.
l. *The* Arteria Aorta, *or* Great Arterie.
m. *The* Vena Cava.
nn.n. *The* Spermatick Arteries.
oo.oo. *The* Spermatick Veins.
p.p.p. *The* Hypogastick Arteries *and* Veins.
rrr. *The* Alæ Uteri, *seu potiùs* Cornuum.
ss. *The* Ovaria.
tt. *The* Tubæ Fallopianæ.
uu. *The* Cornu Uteri *of the Left Side opened.*
w. *The* Cornu Uteri *of the Right-Side not opened.*
xx. *The two* Uteri *opened.*
y. *The* Diaphragm *that divides the two* Uteri.
zz. *The imperfect* Diaphragma, *which partly divides each* Uterus, *and lies over the Passage of that Part of the* Uterus, *which is doubled and tends to the* Vaginæ.

FIGURA TERTIA
More particularly shows the Uterine *Parts.*

AA. *The two* Ovaria.
bb. *The* Fimbria Foliacea.
cc. *The* Tubæ Fallopianæ.
dd. *The two* Cornua Uteri.
EE. *The two* Uteri *reduplicated*

f. *A Slit in the Neck of the Left* Uterus *to shew its Passage into the* Vagina *on that Side.*
g. *The Left* Vagina *opened.*
h. *The* Ostium *or Mouth of the Right* Vagina.
i. *The common Passage from the* Urethra *and* Vaginæ.
K. *The* Urethra.
ll. *The* Bladder *of* Urine *cut off.*

FIGURA QUARTA

Represents the Hairy Tophus, *or Ball of Hair that was taken out of the* Stomach.

FIGURA QUINTA

Represents the Liver.
A. *The* Vena Cava.
BBB. *The three* Lobes *of the* Liver.
C. *The* Bladder *of* Gall.
ddd. *The Fissures in the Body of the* Liver.
eee. *The Incisures at the Edges of the* Liver.

FIGURA SEXTA.

A. *The* Spine *of the second* Vertebra *of the* Neck.
b. *Represents its Thickness.*
c. *A large* Sinus *for the receiving the first* Vertebra.
d. *The* Dens *or* Tooth *of this* Vertebra.
e. *The* Processus obliquus superior *of one Side.*
f. *The* Processus obliquus inferior *of the same Side.*

FIGURA SEPTIMA.

A. *Represents the* Spine *of the third* Vertebra *of the* Neck, *where is shewn its natural thickness.*
b. *The Hole through which the* Medulla Spinalis *passes.*
cc. *Two small* Foramina *for the Passage of Vessels.*
d. *Represents the Cleft at the top of the* Spine.
ee. *The two* Processus obliqui Superiores *before.*
f f. *The two* Processus obliqui Inferiores *before.*

FIGURA OCTAVA

Represents the first Vertebra *of the* Thorax.
A. *The* Spine, *which is long and acute.*
bb. *The* Oblique Processes *before.*
cc. *The* Oblique Processes *behind.*
dd. *The* Transverse Processes.
ee. *Where the* Ribs *are fastened.*
f. *The Hollow where the* Medulla Spinalis *passes.*

FIGURA NONA

Represents the fourth Vertebra *of the* Loins.
aa. *The two upper* Oblique Processes *behind.*
b. *The* Spine.
cc. *The two under* Oblique Processes *behind.*

FIGURA DECIMA

Represents the second and third Vertebra *of the* Tail.
aa. *Two* Vertebræ *of the* Tail.
bbb. *The* Spines *or* Hooks *on the inside, by means of which, it can better hang by its* Tail.
cc. *A Hollow or* Foramen *in the middle of these* Spines, *through which,* Blood-Vessels *passes.*

ERRATA.

Pag. 105. *l.* 5. *r.* at Chirurgions. *p.* 106. *l.* 21. *r.* Simi-vulpa. *p.* 107. l. 26. *r.* Epithet. *p.* 108. *l.* 1. *r.* determined. *l.* 14. *r.* addidi. *p.* 109. *l.* 7. *r.* Crumenam. *p.* 110. *l.* 8. *r.* her. *p.* 112. *l.* 6. *r.* Hexagons. *p.* 113. *l.* 23. *r.* sunk. *p.* 114. *l.* 32. *r.* invicem. *p.* 116. *l.* 5. *r.* proficiscatur. *l.* 10. *r.* quæritare didicerint. *l.* 18. *r.* strepitum. *l. penult.* adapting. *p.* 125. *l.* 12. *r.* ἴνα. *p.* 133. *l.* 29. Columbis. *p.* 140. *l.* 25. *r.* Vetch. *l.* 26. *r.* Vein. *p.* 146. l. 3. *r.* felis. *p.* 147. *l.* 10. *r.* Extream. *l.* 19. *r.* Suture. *p.* 148. *l.* 5. *r.* Lambdoidal. *p.* 149. *l.* 11. *r.* Seive. *p.* 151. *l.* 9. *r.* felis.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Princes Arms* in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

Fig. 1.

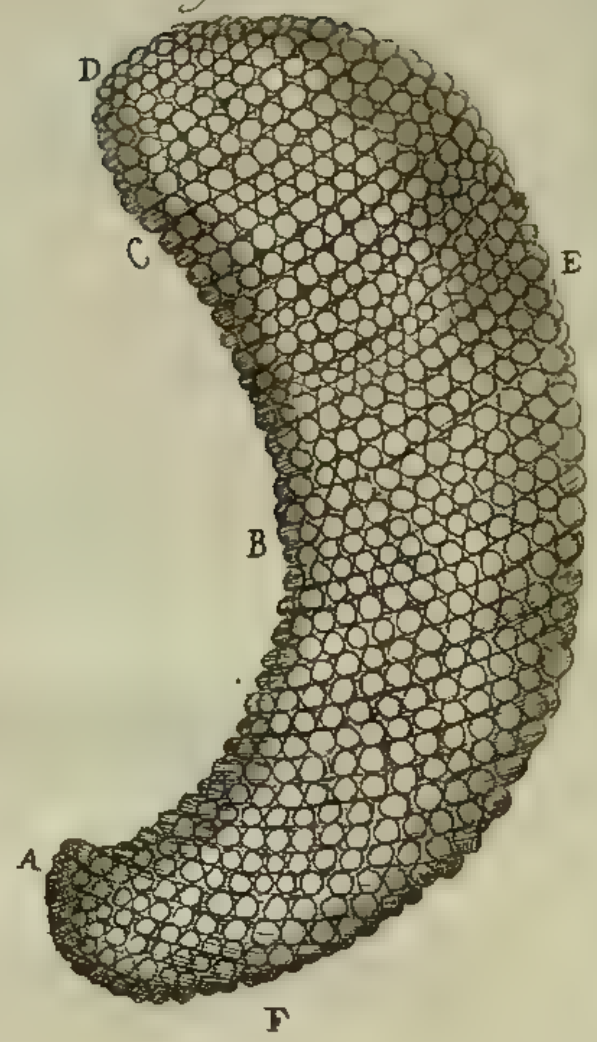


Fig. 2.

Fig. 3.

Fig. 4.

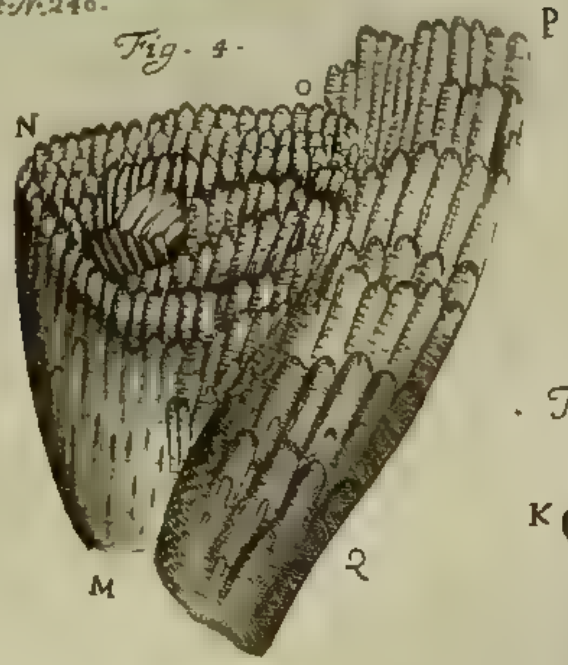


Fig. 5.

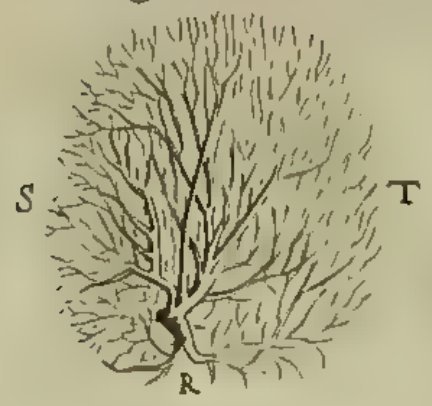


Fig. 6.

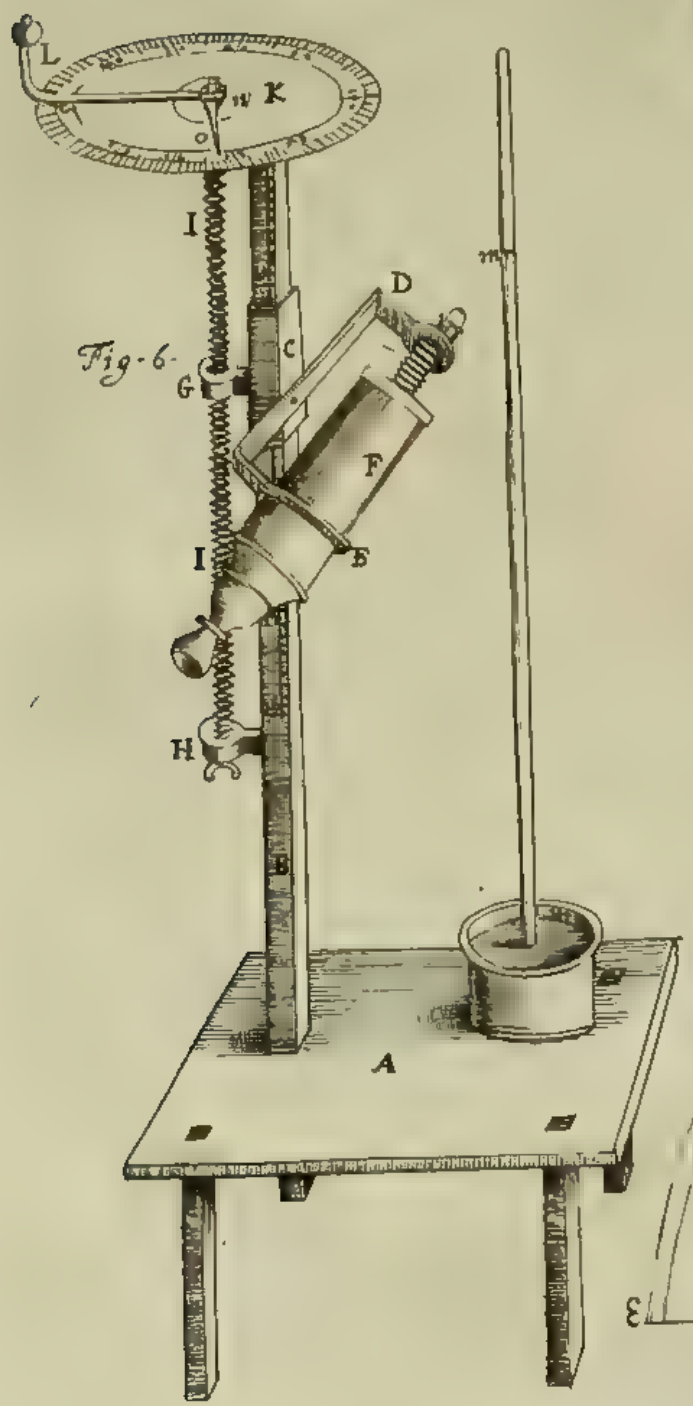
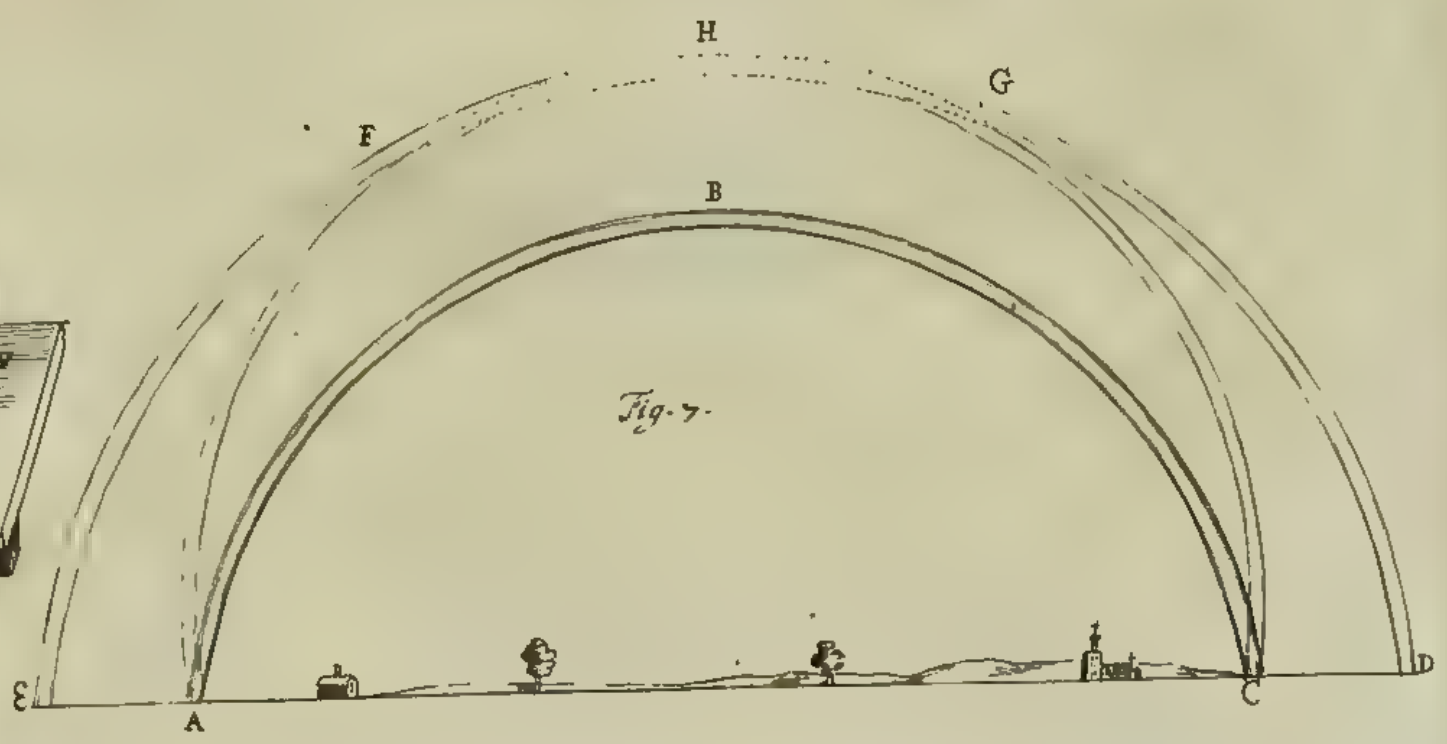


Fig. 7.



PHILOSOPHICAL TRANSACTIONS.

For the Month of May, 1698.

The CONTENTS.

I. *Part of a Letter from Mr.* Benjamin Bullivant, *at* Boſton *in* New England, *to Mr.* James Petiver, *Apothecary, and Fellow of the Royal Society in* London. *Concerning ſome Natural Obſervations he had made in thoſe Parts.* II. *Part of a Letter from Mr.* Anthony van Leeuwenhoeck, *F. R. S. concerning the Eyes of Beetles,* &c. III. *Part of a Letter from Mr.* Stephen Gray, *about a Way of Meaſuring the Heighth of the Mercury in the Barometer more exactly.* IV. *Part of a Letter from Dr.* William Muſgrave, *Fellow of the College of Phyſicians, and R. S. to Dr.* Sloane, *concerning the Cauſe of the Neceſſity of Breathing.* V. *An Account of what happened on Syringing warm Warm Water into the Thorax of a Bitch. By Dr.* William Muſgrave, *Fellow of the College of Phyſians, and R. S.* VI. *Some Obſervations concerning the Subſtance commonly called, Black-Lead, by the late Dr.* Rob. Plot, *F. R. S.* VII.

An Account of one Edmund Melloon, *Born at* Port Leiceſter *in* Ireland, *who was of an extraordinary Size. Communicated by Dr.* William Muſgrave, *Fellow of the College of Phyſicians, and R. S.* VIII. *An Account of the Diſſection of a Dog that had Mercury injected into one of the Jugulars. By Dr.* Chriſtoph. Pitt. IX. *A Letter of Dr.* John Wallis, *of* May 14. 1698. *to Sir* John Blencowe (*one of his Majeſty's Juſtices of the Court of Common-Pleas*) *concerning the Obſervation of* Eaſter *for this preſent Year, on* April 24. 1698. X. *A Method of extracting the Root of an infinite Equation. By* A. De Moivre, *F. R S.* XI. *An Account of the Appearance of an extraordinary* Iris *ſeen at* Cheſter, *in* Auguſt *laſt, by* E. Halley. XII. *Account of Books.* 1. *Voyages and Diſcoveries in* South America: *The Firſt up the River of* Amazons *to* Quito *in* Peru, *and back again to* Brazil, *performed at the Command of the King of* Spain, *by* Chriſtopher D'Acugna. *The Second, up the River of* Plate, *and thence by Land to the Mines of* Potoſi, *by M.* Acarete. *The Third, from* Cayenne *into* Guiana, *in ſearch of the Lake of* Parima, *reputed the richeſt Place in the World, by M.* Grillet, *and* Bechamel. *Done into Engliſh from the Originals, being the only Accounts of thoſe Parts hitherto extant, with Maps.* London, *Printed for* Sam. Buckly, *at the* Dolphin *in* Fleet-Street. 2. *Traite du Cancer, ou l'on explique ſa nature & ou l'on propoſe les moyens les plus ſurs pour le guerir Methodiquement. Avec un examen du ſyſteme & de la pratique de Mr.* Helvetius. *Par Mr.* J. B. Alliot, *Conſeiller du Roy, Medecin ordinaire de ſa Majeſte, & de la* Baſtille, Paris, 1698. in 8vo. XIII. *A Catalogue of Books lately publiſh'd, not mentioned in theſe Tranſactions.* XIV. *Extracts out of divers late Accounts and Letters.*

I. *Part of a Letter from* Mr. Benjamin Bullivant, *at* Boston, *in* New England; *to* Mr. James Petiver, *Apothecary, and Fellow of the Royal Society, in* London. *Concerning ſome Natural Obſervations he had made in thoſe Parts.*

SIR,

THE laſt I addreſſed to you, was by our ingenious Friend Mr. *Trott*, who went hence in *October*; I have ſince received from you Mr. *Joſſelin*'s Book of *New England Rarities*, and obſerve him to be ſhort, but nervous. I cannot now make any deſcant on your Obſervations upon him, only this, that I made the ſame Remark you do, about the *Plague of the Back*, that it is greatly diſtant from an *Empyema*. I have taſted it more than once perſonally, it ſeems more of a *Collick*, yet is undoubtedly a *Nervous Dolour*. The Country People have learned of the *Indians* to ſteep *Caſtoreum* in *Rum*, and ſo cure it.

As to the *Fire-Flies*, I took ſeveral of them in *July* laſt, I take them to be a *Glow-Worm Volant*; the Luſtre is plac'd as in a *Glow-Worm*. Kill the Fly (as I have done) and you find the *Scintilla* a ſmall Jelly like Subſtance, the which ſeparated into Atoms, gives ſtill, in the Dark, a proportionable Luſtre, to the Magnitude of each Atom.

I ſaw *Butterflies Eggs* that were teſtaceous, and near as big as a *Wrens*, moſt glorioufly beſtudded with *Gold* and *Silver*; at *Road Iſland* the Mowers find them in the *Graſs*, and they hatch in the Windows, and are a Sport for Children.

Tortoiſes

Tortoiſes are *Amphibious*, I have found their Eggs by Ponds Sides, in great Quantities, they are without Shells, like thoſe in a Hens Belly ; our Dames ſcruple not to uſe them as Hens Eggs in Puddings.

Graſhoppers, in dry Years, are a Plague to the Huſbandmen : That on ſome Iſlands they have put Multitudes of *Turkeys* to deſtroy them ; they are prodigious in Quantity, of a Grey Colour, and about Three Inches long ; in *July* become Volant, and have a kind of Regimental Diſcipline, and as it were, ſome Commanders, which ſhew greater and more ſplendid Wings than the Commoners, and riſe firſt when they are purſued by the *Fowls*, or by the Foot of the Traveller, which I have often ſeriouſly remarked.

The *Hum-bird* I have ſhot with Sand, and had one ſome Weeks in my keeping. I put a Straw for a Perch into a *Venice Glaſs Tumbler*, ty'd over the Mouth with a Paper, in which I cut Holes for the Bird's Bill (about as long and as ſmall as a Taylor's Needle) and laying the Glaſs on one Side, ſet a Drachm of Honey by it, which it ſoon ſcented, and with its long Tongue put forth beyond its Bill, fed daily ; it muted the Honey pure, and was a Proſpect to many Comers; it flew away at laſt.

We have a *Frog* as big as a *Penny Loaf*, its Cry's exactly like a *Bull*.

I have examined the *Clam*, he hath a *Plain Pipe* or *Proboſcis*, from whence he ejects Water, if compreſſed.

Boſton in *New England*,
Jan. 15. 169¾.

II. *Part of a Letter from* Mr. Anthony van Leeuwenhoek, *F. R. S. concerning the Eyes of Beetles*, &c.

I Have formerly ſpoke of the Multiplicity of Eyes, wherewith the ſmaller ſort of Inſects are endued, as Flies are: which Eyes, I have ſeveral times ſhewn to Perſons of Quality, that came to ſee me, to their great Satisfaction; and that in ſuch a manner, that they could clearly diſcern the ſhewing of ſome Hundreds of Eyes at once clearly: Amongſt the reſt, I have, laſt Summer, ſhewn to ſeveral Engliſh Gentlemen, the Multiplicity of Eyes that are to be ſeen in the *Tunica Cornea* of a Beetle, that is called the Eye.

This Sight was very ſtrange to the ſaid Engliſh Gentlemen; becauſe, that if one will reproach a Man with Blindneſs, or Dimneſs of Sight, they uſe to ſay in Engliſh, *You are as Blind as a Beetle*, becauſe they reckon a Beetle to be Blind.

I have cut that Part of a Beetle, which is reckoned to be his Eye, from the Head, and, after I had made it clean, fixed it before the Magnifying Glaſs, and obſerved, that it could not make up half the Bulk of a Globe, it being broader than it was long.

Further, I have told, to the beſt of my Power, the Eyes that were in One Row, in the greateſt Semi-circle, and found that there was, at leaſt, Three Score of them.

Now let us ſuppoſe, that in the ſmall Semi-circle of the *Tunica Cornea*, there is but Forty Eyes in One Row, and then add theſe Sixty to the Forty, and it makes an Hundred, the half whereof is Fifty, which I do imagine, that if we take the *Tunica Cornea* for half a

Globe, they ſtand in the greater Half-Circuit of the ſame.

So I have ſaid, with *Metius*, to put before me all the Eyes, wherewith a Beetle is endued, that as Two and Twenty is to Seven, ſo is the Quadrat Number of the Circle, to the Superficies.

This being ſo, comes out Three Thouſand One Hundred Eighty One Eyes, that are on both the *Tunicæ Corneæ* of a Beetle; if, as I have ſaid heretofore, they both make up a whole Globe.

I have thought good to let a Deſigner draw a Part of the *Tunica Cornea* of a Beetle, ſo far as he could follow it by the Help of the Magnifying Glaſs, partly, to ſhew the Multitude of Eyes that ſtand upon it; and chiefly, to ſhew that every one of them has a Convexity.

But we muſt not conceive, that every convex Sight of the Beetle, has a Globical Roundneſs; for if it was ſo, he could not ſee the Objects that were ſomewhat diſtant from him (I ſpeak here againſt theſe that have diſcovered ſome Knowledge in the Art of Opticks) but they each of them, a flat kind of Convexity or Roundneſs.

When I told this to the Deſigner, he did compare theſe flat Convexities, to the Buttons we wear in theſe Days, that are ſaid to be made of Prince *Robert*'s Mettal.

Fig. 1. A.B.C.D.E.F. doth ſhew a part of the *Tunica Cornea* of a Beetle.

A B C. doth ſhew that part of it that is united to the Head of the Beetle.

DEFA. is very near to that part of the great Circle of the Superficies of the *Cornea*, whereon I numbered Sixty Faces or Eyes from DEF to A; and between theſe Letters we come to ſee, how each Face or Eye is Elevated into a Roundneſs.

I know that when we fix any Subſtance before the Magnifying Glaſs, that ſome parts thereof muſt be nearer to, and others farther diſtant from the burning Point of the Glaſs, and theſe parts that are ſo, do not ſhew ſharp, but blunt; and therefore when we will ſee or ſhew the Heights of the Eyes that are in the *Cornea*, we muſt put the lower parts of the *Cornea* ſomewhat farther off from the burning Point of the Magnifying Glaſs; ſo that the burning Point, or Sight of the Magnifying Glaſs, may reach theſe that are in the *Cornea*, as we muſt do with Two or more grounded Glaſſes, fixed in a Box; and this being ſo, we ſhould have an Hundred Objects of the Eyes that are in the *Cornea*, ſeen at once, but yet very ſmall; for the Steeple of our new Church, whoſe Diſtance is great, as I have related in my former Letters, ſeem, through the Eyes of the Beetle, no bigger to me than the Point of a ſmall Needle.

Here we ſee now, how theſe are miſtaken, that take the Beetle to be blind, and how ſufficiently this ſmall Animal is provided with Sight, not to ſpeak of the other Parts of his Body; which Inſect, when we meet it, we tread under our Feet, as having no eſteem for ſo Black a Creature.

In the Month of *Auguſt*, in the Year laſt paſt, I ſaw a Fly creeping on the Windows of the back Part of my Houſe, which was of the Bigneſs of a Bee; which ſort of Flies (yet very few of them) I have obſerved there to come every Year.

The Paws of theſe Flies, chiefly that Side they run withal, are plentifully provided with Hair-like Parts, wherewith they know to run upon Polliſhed Glaſs, more than any other ſort of Flies. I have cut off Paws, and fixed them before the Magnifying Glaſs, for to ſhew the

Tools wherewith they are able to fix themſelves to the Poliſhed Glaſs, and ſo to run up.

I have alſo cut off the *Cornea* of the Head of theſe Flies, and have obſerved that it was beſet with very many ſmall Hairs, which were placed not upon the Eyes, but between them.

Further, I have taken the Matter that fills up the *Cornea* out of it, to judge of it by the Help of the Magnifying Glaſs, and that the rather, becauſe I could never before ſatisfy my ſelf about it, *viz.* to what Purpoſe this Stuff was made; and I did conclude, that this Matter was conſiſting of a Subſtance like unto a Thread.

When I had ſpread a little aſunder, the mentioned Matter, that I might obſerve it with more Attention, than I had yet done before; I ſaw, that all this Stuff, which I had judged to be a Thread, was very near altogether of the ſame Length, and that one End was ſomewhat thicker than the other, and roundiſh on the thicker End.

By theſe accurate Obſervations, and near Conſiderations, which I often repeated one after the other, I did aſſure my ſelf, that this great Number of ſmall Parts, which I ſaw there, was each of them a Nerve of an Eye, and that the thick and round End of it had been placed in the Hollowneſs of the *Cornea*: In ſhort, as many Sights as are in the *Cornea*, ſo many there is of Nerves.

The Reaſon why One End of the Nerves of the Eyes that goeth inwards towards the Head, is thinner, as I have ſaid before, muſt neceſſarily be, becauſe the *Cornea* has a roundiſh Bulkineſs, and therefore the Sinews muſt be the thinner, the farther they go in; for the room grows leſs than it is, by the Hollowneſs of the *Cornea*, and who doth know whether, that Part where the Optick Nerves do end, be not the Brain? which muſt be inquired after.

I have, to give the more Satisfaction, laid ſome Nerves of the Eyes, which I had taken out of the beforementioned Fly, upon Glaſs, laſt Year, and fixed it before the Magnifying Glaſs, to have it delineated, as well as the Deſigner could follow it.

Fig. 2. G H, are Two Optick Nerves, H being placed very near, or quite in the Hollowneſs of the Sight, and G was placed inwards, toward the Head of the Fly.

Fig. 3. I K L, are Seven Optick Nerves, the thickeſt End whereof was alſo placed towards the *Cornea.*

Fig. 4. M N O P Q, ſhewed a great Number of the Optick Nerves, that lye one upon the other, whereof the upermoſt Ends, as N O P, were alſo placed to the *Cornea*; and becauſe there lie ſo many one upon another, one cannot diſcern the true Length of them, and where they lay ſomewhat thick, the Light can conveniently be diſcerned, for they are ſomewhat tranſparent, as is ſhewed in the laſt named Figure.

I have formerly ſhewed, how every thin part of Fleſh, or Fiſh, when it doth lie in Reſt, is full of Wrinkles, or elſe full of Rings like Joints, but when they are brought out of Reſt, and are employed, the Wrinkles and Rings are gone, and the Parts grow longer.

Theſe Ring-like Wrinkles I have alſo obſerved or diſcovered in the Optick Nerves of the ſaid Fly, from whence we may well conclude, that each of theſe ſmall Optick Nerves, are as well provided with Extenſion, as the Nerves of our Eyes; for we cannot move our Eyes from one ſide to the other, but the Nerves of our Eyes muſt be more extended than if we ſee out Straight.

When

When I had diſcerned theſe, I asked the Deſigner, Whether he could ſee theſe Ring-like Stripes, in the Optick Nerves? and when he ſaid he could ſee them clearly, I charged him to follow them as much as was Poſſible, as you may ſee in *Fig.* 2. and 3.

Yet if the Fly had been Dead for ſome while, when I had taken out the Nerve of the Sight, I could have obſerved none of this Wrinkling; as we daily ſee, that the Muſcles of a Fiſh that has been dead for a good while, do not contract themſelves when they are cut in Pieces, which we call Krimping; and in this Caſe, the Parts of the Fiſh are not ſo hard, nor ſo well taſted, as they would have been, if they had been cut before they were quite dead.

Having diſcovered theſe wonderful Things and Perfections of the Eye of a Fly, we muſt ſay again, how little it is we know, and if this is ſo in a great Fly, it muſt be the ſame in a leſs one.

Further, I have ſince, a few Days ago, taken out of common Flies Eyes, the Optick Nerves, and have lookt upon them ſeveral times, becauſe I had great Pleaſure to ſee them in ſo neat an Order, and finding them, where they do not lie too cloſe together, of the Colour of Red Lead.

I did, when the Deſigner was buſy to make the forementioned Draught, catch a ſmall Gnat, of that ſort that do not afflict Men, becauſe they are no Blood-Suckers, nor have no Sting.

I cut off the Head of this, to draw out of the Eyes or Sights, the Optick Nerves; but I could not ſhew them clear enough before my Eyes, although I did attempt it three or four times; in which Undertaking, I took ſeveral times the Nerves of the Eye, ſurrounded with a vaſt Number of Veſſels, which I was ſure to be Veins; and I could

could not accompliſh to pull theſe Nerves out of the Head, without breaking them and the Veins, until at length it did happen, that I did pull them out of the Head of the Gnat, without breaking off either of them, which, put before the Magnifying Glaſs, I gave to the Deſigner to draw, and that the rather, becauſe a Gentleman of Quality did tell me, that a certain Perſon, when they came to ſpeak of my Diſſecting, did often object, That it was impoſſible to do what I did affirm, becauſe the Inſtruments I was to uſe for that purpoſe, how ſmall ſoever I could make them, could not be fit to make theſe Diſſections I did relate: But I do not matter theſe Objectors, perhaps it is one of them, that doth wiſh he could do the ſame.

Fig. 5. R. S. T. ſheweth the Nerves of the beforementioned Gnat, as well as the Deſigner could delineate them, he oftentimes repeating, That it was impoſſible to delineate all the Veſſels he did ſee.

I have alſo, not only taken out of the Paws of the beforeſaid Gnat, the Fleſhy Muſcles, to my full Satisfaction, but alſo the Two Pullers that are between each Joint of the Paw, whereof one doth extend, and the other contract the Joints; and this is no Labour for me. But I conclude and remain,

Delft, May 9.
1698. T O U *R's*, &c.

III. *Part of a Letter from Mr.* Stephen Gray, *about a Way of Measuring the Heighth of the Mercury in the Barometer more exactly.*

SINCE I saw Mr. *Derham*'s Contrivance for measuring the Minute Variations of the Mercury in the Barometer, I have had some Thoughts on that Subject: I esteemed the Way he mentions (*Numb.* 237. of your *Philosophical Transactions*) with a toothed Ruler and Circle on the Weather-Plate, very ingenious; yet I conceived 'twould be more accurate, if there were added somewhat to assist the Eye in setting the Index to the Surface of the Mercury. This put me upon thinking how to adapt a Microscope to the Barometer, and tho' I could not, presently, propose to my self the most convenient way to effect it; yet upon re-assuming these Thoughts, I overcame the Difficulty, as you will find by the Description I herein give of a double Microscope, furnished with a Micrometer; by which the Mercury's Variations may be observed to the Thousandth Part of an Inch.

A (*Fig.* 6.) A long square Table towards one End is erected a square Column, BB. Upon which there slides a square Socket. C, From one Side whereof proceeds a crooked Arm, D E. At D there is a Screw-Hole to receive the Screw, and at E a Ring to support the Tube of the Microscope, F. From the other Side the Socket, comes a Short Arm G, having a Screw Hole to receive the long Screw I I, whose length may be about Six or Seven Inches: its lower End, by a small Hole in its Center, rests on the End of a small Screw, that comes through the Screw-Hole, in the Arm H; which is fixed on the back Side of the Column; the upper End of the Screw is filed

less

leſs than the Body of the Screw, and goes through the Center of the Round Plate without ſhaking; and to prevent its doing ſo, either upwards or downwards, there is added a ſpringing Plate N, which keeps the Shoulder of the Screw cloſe to the under ſide of the Plate K; over this Plate there goes an Index O, and over that an Handle L, upon the End of the Screw which comes through the Center of the Plate, which I ſhould before have told you, is riveted to the Top of the Column B B. The Teeth of the Screw muſt be of that Size, as to have juſt Ten in an Inch. The fore ſide of the Column muſt be divided into Inches and Tenths, beginning about the Height of the Socket H, where the lower end of the Screw reſts, and ſo continue to the Top of the Column. The Limb of the Round Plate muſt be divided into an Hundred Parts. In the Focus of the Eye-Glaſs of the Microſcope is fixed an Hair, or very fine Silver Wire, in a Horizantal Poſition.

I come now to ſhew the Uſe of the Inſtrument combined with the Barometer, in which I ſhall be very brief, its Uſe being eaſily apprehended by the Deſcription.

Take hold of the Handle, and, looking through the Microſcope, turn the Screw till you have brought the Hair to touch, as it were, the Surface of the Mercury M; then obſerve what Diviſions are cut on the Column, by the upper or under Edge of the Socket, which are Tenths of an Inch. See likewiſe to what Parts the Index points on the Limb of the Round Plate, which are Hundreds of a Tenth, or Thouſand Parts of an Inch; when you perceive the Mercury varied, raiſe or depreſs the Microſcope, till the Hair be brought to its Surface, as before; then by ſubſtracting the leſſer from the greater of the Two obſerved Numbers, you will have the Variation in Inches and Thouſand Parts.

This Instrument becomes a Micrometer on the same Principles, tho' I was obliged to alter its Structure from that used with the Telescope, which was first invented by Mr. *Gascoign*, improved by Mr. *Townly*, and described by Dr. *Hook*, as appears by *Numb.* 25. and 29. of Mr. *Oldenburg*'s *Philosophical Transactions*; to which Description, if I did not acknowledge my self beholden, were to do great Injustice to the Authors of that excellent Invention.

The Thermometer is capable of the like Improvement, but then the Screw of the Micrometer must be much longer, and the Microscope will require a longer Tube, to the End the Body of the Observer be not too near the Thermometer, and by its warm Effluvia deceive his Judgment in the Air's Temperature.

Canterbury, May 2.
1698.

IV. *Part of a Letter from Dr.* William Musgrave, *Fellow of the College of Physicians, and R. S. to Dr.* Sloane, *concerning the Cause of the Necessity of Breathing.*

YOU know, how difficult it has been thought, to account for the principal Use of Respiration: Nothing is more evident, than that breathing is, from the very Moment of our Birth, perpetually necessary to Life; yet nothing more in the Dark, than the true Cause and Reason of that Necessity.

Dr. *Thruston* asserts the chief Use of Respiration, to consist, in maintaining a due Motion of the Blood.

Officina

Officium illud [*Respirationis præcipuum*] *Nos in eo maximè positum arbitramur, quòd Sanguinis Motui inserviat, eumq; tueatur.* pag. 6. Edit. *Lond.* 1670.

And, to make out his Assertion, he urges (among other Arguments of less note) That this Opinion, easily explains, the Manner of Sudden Death, by Strangling; by drowning; and by violent Catarrhs; supposing Death, and the Stagnation of the Blood in the Lungs, Right Ventricle of the Heart, *&c.* to arise, in all these Cases, from the Stoppage of the Breath.

Etmuller embraces the same Opinion; and, in Defence of it, alledges the same Argument: Indeed they both depend on it, as highly probable and convincing.

Tho', I think, the Opinion is very Rational; I cannot say it appears such, from the Argument now produc'd; which, upon Examination, will be found too liable and obnoxious to bear so great a Proportion of the Proof.

By Dr. *Thruston*'s own Concession, (*pag.* 173.) Men that are Hang'd, may, with good Reason, be supposed to die, partly, from the mutual Commerce between the Head and Heart, being now intercepted. The remarkable Lividness of their Faces, with the extraordinary Distention of the Jugulars, in their several Branches above the Ligature, argue, they die, in a great Measure, *Apoplectical.*

Now, whatever share the Interruption of this mutual Commerce has, in killing the Man; so much the less Reason have we to impute his Death, and the Stagnation of Blood in his Lungs, *&c.* to the Stoppage of his Breath.

Nor is the Second Case (that of Sudden Death by Drowning) without Exception: For here, the Water rushing, after an unusual Manner, into the Lungs, may

be ſuſpected ſo to affect them, as to occaſion Death, tho' not by ſtopping the Circulation.

And, as to Suffocation from a Catarrh, inſtances of this Kind, with Anatomical Obſervations on them, have not (to me at leaſt) occur'd, ſufficient to prove, what was intended by this Argument.

Wherefore, that a Noble Propoſition may not want Evidence, and that the Opinion, my Learned Countryman has ſo ingeniouſly defended, may for ever obtain, I pitcht on the following Experiment as Luciferous, and, I hope it will appear deciſive of the Matter.

I took a large, middle-aged, healthy Dog; and, having freed the *Trachea* from the adjacent Parts, cut it off juſt beneath the *Pomum Adami*, and turn'd the looſe End outward. After ſome time allowed him to recover the preſent Concern; with a Cork, got ready on purpoſe, I ſtopt up the *Trachea*, binding it cloſe to the Stopple. Some few, but violent Struggles ſucceeded; in which the Sternum was raiſed, as in the deepeſt Inſpiration; and thus he died. From the Stoppage of his Breath, to the laſt Motion I could diſcern in any Part of his Body, was, from a Watch, obſerved to be the Space of Two Minutes. I then immediately threw open the *Thorax*; where I ſaw the Blood Stagnating in the Lungs; the *Arteria Pulmonaris*, the Right Ventricle of the Heart, with its appending Auricle, and the Two great Trunks of the *Cava*, diſtended with Blood, to a Degree exceſſive: The *Vena Pulmonaris*, Left Auricle and Ventricle of the Heart, in a Manner Empty; not containing (as near as I can gueſs) more than One Spoonful of Blood.

This Experiment proves, That the Reſpiration promotes the Paſſage of the Blood thro' the Lungs; and that in Bodies full of vigorous Blood, it is, on this Account of perpetual Neceſſity.

This

This Acceleration of the Blood in that Paſſage, ſeems to be the principal uſe of Reſpiration; no other is of ſuch Conſequence to Life, or ſtands in Competition with it.

Exon, May 9.
1698.

V. *An Account of what happened on Syringing warm Water into the Thorax of a Bitch. By Dr.* William Muſgrave, *Fellow of the College of Phyſicians, and R. S.*

ON *Thurſday*, the 21ſt of *June*, 1683. I ſyringed ℥iv. of warm Water into the Right Side of a Grey-hound Bitch; which cauſed a great Rigour (eſpecially in the Hinder Parts) a Shortneſs of Breath; a Heat, or burning in the Fleſh; ſhe looked heavy, was unwilling to riſe or ſtand long on her Feet; thoſe Symptoms wore off by Degrees, ſo that in a Weeks time ſhe appeared as well as ever.

On the 2d of *July* following (that is Eleven Days after the former Experiment) I injected ℥xvj. of warm Water into the Left Side of the Thorax of the ſame Grey-hound, after which ſhe was extreamly hot, and ſhort Breath'd, I felt a violent throbbing in her Heart, but the Rigour was not ſo great as in the firſt Experiment; ſhe recovered this alſo in the Space of a Week.

About the 15th *ditto*, I injected ℔j ß of Warm Water into one Side of the Thorax, and ℔ß. into the other Side of the ſame Bitch; the Symptoms attending it were (as in the former Experiments) a burning in the Fleſh,

and

and a ſhortneſs of Breath; they all went off, and in Five Days time ſhe ſeemed perfectly recovered.

Thus we ſee a Quantity of ℔iij. ℥. of warm Water has been injected into the middle *Venter* of the ſame Greyhound, within the Space of One Month, and if we may be allowed to judge of the Recovery, by a perfect Ceſſation of all Symptoms, as to outward Appearance, we muſt then grant, that this Water was carried off thence, in the time, but to give an Account which way it was diſcharged (whether by Expiration, Perſpiration, Siege or Urine) ſeems very difficult, and is beyond my Anatomy to explain; only thus much I muſt ſay, as to the latter; that having ordered the Greyhound to be tied away, after One of the Two laſt Experiments, within Two or Three Days, I obſerved the Boards of the Floor where ſhe lay, to be very wet, which I then imagined to be the Effects of the Injection, come off by Urine, if I may have leave to give a Conjecture in a Matter of ſo much Uncertainty, it ſhall be this; that as, Nature has furniſhed us with Veſſels to bring off that Humour which is thrown into the Ventricles of the Brain, which by tarrying there would prove fatal to us, ſo likewiſe (poſſibly) there may be ſome *Ductus* yet unknown (to me at leaſt) which belonging to the Thorax, may convey off thence what Liquor ariſes, either from the Condenſation of Vapours, or from the Rupture of Lymphatics, or any other way, in the Cavity mediately, or immediately, into the Blood; certainly theſe Experiments, as alſo the many Hiſtories of Empyema's, and Dropſies of the Breaſt, mentioned by Phyſicians, as cured by large Evacuations by Urine, do (in ſome meaſure) argue the Poſſibility of this thing; but whether in reality there be any ſuch Paſſage, or no, may in a little time be rendred leſs queſtionable, than now it is, upon the Tryal of ſuch Anatomical Experiments,

periments, as ſeem to promiſe a full Deciſion in this Matter.

VI. *Some Obſervations concerning the Subſtance commonly called, Black-Lead, by the late Dr.* Rob. Plot, *F. R. S.*

THE Mineral Subſtance, called, Black Lead (our common Lead being the true Black Lead, and ſo called, in Oppoſition to Tin, which is the White Lead) found only at *Keſwick* in *Cumberland*, and there called, *Wadt*, or *Kellow*; by Dr. *Merret*, *Nigrica Fabrilis*, from its uſe in Scoring, as the *Rubrica Fabrilis*, or the Red Ochre is; is certainly ſo far from having any thing of Mettal in it, that it has nothing of Fuſion, much leſs Ductility; nor can it be reckoned amongſt the Stones, for want of Hardneſs; it remains therefore that it muſt have Place amongſt the Earths, tho' it diſſolve not in Water, as moſt Earths will, except ſtiff Clays, and Ochres; among the latter whereof I gueſs it may be reckoned, it ſeeming to be a ſort of cloſe Earth, of very fine and looſe Parts, ſo burnt that it is become Black and Shining, diſcolouring the Hands, as all the Ochres do; whence the moſt Proper Name that can be given it, perhaps, may be *Ochra Nigra*, or Black Ochre, being a Stony Sort, as there are Stony Sort of the Red and Yellow Ochres, as well as Clay.

VII. *An Account of one* Edmund Melloon, *Born at* Port Leiceſter, *in* Ireland, *who was of an extraordinary Size. Communicated by Dr.* William Muſgrave, *Fellow of the College of Phyſicians, and R. S.*

THE Meaſures of ſome of the Parts of an Iriſh Man ſhewn at *Oxford*, was communicated to me by Dr. *Plot*, he was Seven Foot Six Inches high, his Finger Six Inches Three Fourths long, the Length of his Span Fourteen Inches, of his Cubit Two Foot Two Inches, of his Arm Three Foot Two Inches and an Half, from the Shoulder to the Crown of his Head Eleven and Three Fourths, his Name *Edmund Melloon*, he was Aged Nineteen Years, *Anno* 1684. and Born at *Port Leiceſter* in *Meath*, in *Ireland*.

VIII. *An Account of the Diſſection of a Dog that had Mercury injected into one of the Jugulars. By Dr.* Chriſtoph. Pitt.

THE Mercury was thrown out of the Blood into the Cavity of the Abdomen, as likewiſe ſome Appearance of it in the other Cavities of the Body.

All the Glandules were very turgid, and full of Liquor, eſpecially in the Ventricles of the Brain, and all round there was a great Quantity of Serum. This may be called a true *Hyarocephalos*.

It being a chance Dog, and having no Notice of what had been done on him, I could not ſo well obſerve whether it would work on him by Salivation, whether it made

made him duller than ordinary, or how long the Quick-Silver had been in his Body.

IX. *A Letter of Dr.* John Wallis, *of* May 14. 1698. *to Sir* John Blencowe *(one of his Majesty's Juſtices of the Court of Common-Pleas) concerning the Obſervation of* Eaſter *for this preſent Year, on* April 24. 1698.

Sir, Oxford, May 14. 1698.

IN Anſwer to yours of *May* 12. (which I received this Morning) you may pleaſe to preſent my humble Duty and Service to the Lord Chief Juſtice *Holt*, with this Account of the *Seat of Eaſter*, of which he asketh.

That there may be ſome little Miſtakes in the Calendar of the Common-Prayer Book (as now Printed) I ſhall not deny.

But (as to the preſent Point) *Eaſter* was obſerved this Year, according to the Rules, ſo underſtood as was intended, though there may ſeem to be wanting a Rubrick to make it plain.

The fundamental Rule of the Nicene Council (which we pretend to follow) for the keeping of *Eaſter*, is to this purpoſe:

Eaſter-Day is to be that *Sunday* which falls *upon, or next after*, the firſt Full Moon which happens next after the Vernal Equinox.

Which Vernal Equinox was then obſerved to fall on the One and Twentieth of *March*: And (in the Paſchal Tables) is yet reputed ſo to fall; (though it do now fall on the Eleventh of *March*, or ſometimes the Tenth of *March*.)

And therefore inſtead of *next after the Vernal Equinox*, we ſay, *next after the One and Twentieth of* March.

But then it is ſaid (by a Miſtake, I ſuppoſe) *after the Firſt Full Moon*, inſtead of *upon, or next after the Firſt Full Moon*, (for ſo it is to be underſtood) and added, *And if the Full Moon happens upon a Sunday, Eaſter-day is the Sunday after.* Which muſt needs be a Miſtake. For, in ſuch Caſe, it is to be *that Sunday*, not *the Sunday after.*

And ſo the Tables agree (contrary to this Note) both that *For Forty Years*, and that *To find Eaſter for Ever.*

And ſo it was obſerved in the Years 1668, 1678, and 1682. And ſo whenever the Caſe happens, that the Eccleſiaſtical Full Moon falls on a *Sunday*. But this (though it be a Miſtake) doth not influence the preſent Caſe.

That which concerns the preſent Caſe, is, On what Day we muſt reckon the *Eccleſiaſtical* Full Moon to fall.

For we are not to judge, either the *Equinox*, or the *Full Moon*, according as they happen in the Heavens, or in our Almanacks; but according to the Paſchal Tables, fitted to the time of the Nicene Council.

And accordingly, we reckon the Equinox to be now (as then it was) on *March* 21.

And as to the Full Moon (next after that Equinox) we are to Account it thus:

The Golden Number (fitted to the Cycle of Nineteen Years; after the End of which it begins again, at 1, 2, 3, &c.) is placed in the firſt Column of our Calendar, to tell us, on what Day (of ſuch Year) the New Moon is *ſuppoſed* to happen, in each Month; and the Fifteenth Day of that Moon is *reputed* the Full Moon.

Now

Now the Golden Number, for the Year 1698, is 8. (That is, this is the Eighth Year of ſuch Decem-novenal Cycle, or Circle of Nineteen Years; commonly called *Cyclus Lunaris*, or the Circle of the Moon; as the other Circle of Twenty Eight Years, is called, *Cyclus Solaris*, the Circle of the Sun, or rather of the Sunday-Letter.)

And this Number 8 ſtands in the Calendar at *Mar.* 6. which we muſt therefore *ſuppoſe* to be New Moon: (Though the New Moon were indeed *Mar.* 2. Like as it happens conſtantly in this Age, that the true New Moon is Four or Five Days ſooner than the *reputed* Eccleſiaſtical New Moon.)

Now *Mar.* 6. being the New Moon, or Firſt Day of the (*reputed*) Lunar Month (for ſuch Year) *Mar.* 20. will be the 15th Day, or the (*reputed*) Full Moon for the Month of *March* this Year.

Which happens, this Year, to be *Sunday*; (the Dominical Letter, for this Year, being *B.*)

But this happening before *March* 21. (the ſuppoſed Equinox) cannot be the Paſchal Full Moon; but we muſt wait for another.

And we ſhall then find the Golden Number 8, ſtanding at *Apr.* 5. for the New Moon of *April*, the ſame Year.

And therefore the Full Moon, or 15th Day of that (reputed) Lunar Month, is to be *Apr.* 19. (But the true Full Moon was *Apr.* 15. about Six a Clock in the Morning.)

Which (*Apr.* 19.) being *Tueſday*, the *Sunday* next following is *Apr.* 24. (where ſtands *B*, the *Sunday* Letter for this Year) which is therefore to be *Eaſter-day*, according to the intent of theſe Tables. And it was obſerved accordingly.

But it were to be wiſhed, there had been ſomewhere a Rubrick, to direct how we are to find this (reputed) Full Moon; and, what is the Uſe of the Golden Number.

The Difference of the Eccleſiaſtick Account, in the Paſchal Tables, from that of the Heavens, doth ariſe from hence; Becauſe thoſe Tables, when firſt made, were fitted, not to this Age, but to that of the Nicene Council; and did, at that time, agree very near with that of the Heavens: But, in this Age, they do conſiderably differ, (both as to the *Equinox*, and as to the *Full Moons*) for theſe Two Reaſons:

I. The common Julian Year (by which we reckon) of 365 Days and 6 Hours, is ſomewhat too long; being about 11 Minutes of an Hour longer than the true Solar Year.

By reaſon whereof, the Equinox (and other Annual Seaſons) go backwards about 11 Minutes, every Year: Which, from the Time of the Nicene Council, till now, amounts to about 11 Days.

So that the Equinox which then happened *Mar.* 21. is now come back to our *Mar.* 11. or rather *Mar.* 10.

Which, upon Pope *Gregory*'s reforming the Roman Calendar (above 100 Years ſince) cauſeth the Difference of 10 Days, between what we call the *New Stile* and the *Old Stile*. Which (Two Years hence) in the Year 1700 (and thenceforth for 100 Years) will be 11 Days.

II. It was then ſuppoſed, that in 19 Years (which is the Compaſs of the Golden Number) the Lunations (of New Moon and Full Moon) did return to the ſame Day and Hour, as they were 19 Years before.

Which

Which is pretty near the Truth, but comes ſhort by about an Hour and half.

Which *Hour and Half*, in every 19 Years, doth, ſince that Time, amount to about 4 or 5 Days.

Whence it comes to paſs, that the *reputed* Full Moon is later, by 4 or 5 Days, than that of the Heavens.

But our *Eaſter*, is reckoned according to the *reputed* Full Moons (derived from the Golden Number) not according to thoſe of the Heavens.

'Tis true, that in ſome Places of our Calendar (as commonly printed) the Golden Numbers are mis-placed, or mis-written. But it happens ſo luckily, that in all thoſe wherein *Eaſter* is concerned (that is, from *Mar.* 6. to *Apr.* 5. incluſively) they be rightly placed.

And as to any other New Moons, if there be any miſtakes, we are therein leſs concerned.

X. *A Method of extracting the Root of an Infinite Equation.* By A. De Moivre, *F. R. S.*

Theorem.

IF $az + bz^2 + cz^3 + dz^4 + ez^5 + fz^6$, &c. $= gy + hyy + iy^3 + ky^4 + ly^5 + my^6$, &c. then will z be $= \frac{g}{a}y + \frac{h - bAA}{a}y^2$

$$+ \frac{i - 2bAB - cA^3}{a}y^3$$

$$+ \frac{k - bBB - 2bAC - 3cAAB - dA^4}{a}y^4$$

$$+ \frac{l - 2bBC - 2bAD - 3cABB - 3cAAC - 4dA^3B - eA^5}{a}y^5$$

$$+ \frac{m - 2bBD - bCC - 2bAE - cB^3 - 6cABC - 3cAAD - 6dAABB - 4dA^3C - 5eA^4B - fA^6}{a}y^6 \text{ &c.}$$

For the understanding of this Series, and in order to continue it as far as we please; it is to be observed, 1. That every Capital Letter is equal to the Coefficient of each preceding Term; thus the Letter B is equal to the Coefficient $\frac{h - bAA.}{a}$ 2. That the Denominator of each Coefficient is always a. 3. That the first Member of each Numerator, is always a Coefficient of the Series $gy + hyy + iy^3$, &c. *viz.* the First Numerator begins with the first Coefficient g, the Second Numerator with the Second Co-efficient h, and so on. 4. That in every Member after the First, the Sum of the Exponents of the Capital Letters, is always equal to the Index of the Power to which this Member belongs: Thus considering the Coefficient $\frac{k - bBB - 2bAC - 3cAAB - dA^4}{a}$, which belongs to the Power y^4, we shall see that in every Member bBB, $2bAC$ $3CAAB$, dA^4, the Sum of the Exponents of the Capital Letters is 4, (where I must take notice, that by the Exponent of

a

a Letter; I mean the Number which expreſſes what Place it has in the Alphabet; thus 4 is the Exponent of the Letter *D)* hence I derive this Rule for finding the Capital Letters of all the Members that belong to any Power; *Combine the Capital Letters as often as you can make the Sum of their Exponents Equal to the Index of the Power to which they belong.* 5. That the Exponents of the ſmall Letters, which are written before the Capitals, expreſs how many Capitals there is in each Member. 6. That the Numerical Figures or *Unciæ* that occur in theſe Members, expreſs the Number of Permutations which the Capital Letters of every Member are capable of.

For the Demonſtration of this; ſuppoſe $z = Ay + Byy + Cy^3 + Dy^4$, *&c.* Subſtitute this Series in the room of z, and the Powers of this Series, in the room of the Powers of z; there will ariſe a new Series; then take the Co-efficients which belong to the ſeveral Powers of y, in this new Series, and make them equal to the correſponding Co-efficients of the Series $gy + hyy + iy^3$, *&c.* and the Co-efficients A, B, C, D, *&c.* will be found ſuch as I have determined them.

But if any one deſires to be ſatisfied, that the Law by which the Co-efficients are form'd, will always hold, I'll deſire 'em to have recourſe to the Theorem I have given for raiſing an infinite Series to any Power, or extracting any Root of the ſame; for if they make uſe of it, for taking ſucceſſively the Powers of $Ay + Byy + Cy^3$, *&c.* they will ſee that it muſt of neceſſity be ſo. I might have made the Theorem I give here, much more general than it is; for I might have ſuppos'd,

$az^m + bz^{m+1} + cz^{m+2}$ *&c.* $= gy^m + hy^{m+1} + iy^{m+2}$ *&c.* then all the Powers of the Series $Ay + Byy + Cy^3$, *&c.* deſign'd by the univerſal Indices, muſt have been taken ſucceſſively; but thoſe who will pleaſe to try this, my eaſily do it, by means of the *Theorem for raiſing an infinite Series to any Power,* &c.

This *Theorem* may be applied to what is called the Reverſion of Series, ſuch as finding the Number from its Logarithm given; the Sine from the Arc; the Ordinate of an Ellipſe from an Area given to be cut from any Point in the Axis: But to make a particular Application of it, I'll ſuppoſe we have this Problem to ſolve; *viz.* The Chord of an Arc being

ing given, to find the Chord of another Arc, that shall be to the first as n to 1. Let y be the Chord given, z the Chord required; now the Arc belonging to the Chord y is, $y + \frac{y^3}{6dd} + \frac{3y^5}{40d^4} + \frac{5y^7}{112d^6}$ &c. and the Arc belonging to the Chord z is $z + \frac{z^3}{6dd} + \frac{3z^5}{40d^4} + \frac{5z^7}{112d^6}$ &c. the first of these Arcs is to the second as 1 to n; therefore multiplying the Extreams and Means together, we shall have this Equation:

$$z + \frac{z^3}{6dd} + \frac{3z^5}{40d^4} + \frac{5z^7}{112d^6} \text{ \&c.} = ny + \frac{ny^3}{6dd} + \frac{3ny^5}{40d^4} + \frac{5ny^7}{112d^6} \text{ \&c.}$$

Compare these Two Series with the Two Series of the *Theorem*, and you will find $a = 1$, $b = 0$, $c = \frac{1}{6dd}$, $d = 0$, $e = \frac{3}{40d^4}$ $f = 0$, &c. $g = n$, $h = 0$, $i = \frac{n}{6dd}$, $k = 0$, $l = \frac{3n}{40d^4}$, $m = 0$, &c. hence z will be $= ny + \frac{n - n^3}{6dd} y^3$ &c. or $ny + \frac{1 - nn}{2 \times 3dd} yyA$, &c. Supposing A to denote the whole preceding Term, which will be the same Series as Mr. *Newton* has first found.

By the same Method, this general Problem may be solv'd; the Abscisse corresponding to a certain Area in any Curve being given, to find the Abscisse, whose corresponding Area shall be to the first in a given Ratio.

The Logarithmic Series might also be found without borrowing any other Idea, than that Logarithms are the Indices of Powers: Let the Number, whose Logarithm we inquire, be $1 + z$, suppose its Log. to be $az + bzz + cz^3$, &c. Let there be another Number $1 + y$; thereof its Logarithm will be $ay + byy + cy^3$, &c. Now if $1 + z = \overline{1 + y}^n$, it follows, that $az + bzz + cz^3$ &c, $ay + byy + cy^3$, &c :: n, 1. that is, $az + bzz + cz^3$, &c. $= nay + nbyy + ncy^3$, &c,

Therfore

Therefore we may find a Value of z expreſt by the Powers of y; again, ſince $1+z=\overline{1+y}|^n$, therefore $z=\overline{1+y}|^n-1$ that is $z=ny+\frac{n}{1}\times\frac{n-1}{2}yy+\frac{n}{1}\times\frac{n-1}{2}\times\frac{n-2}{3}y^3$, *&c.* Therefore z is doubly expreſt by the Powers of y. Compare theſe Two Values together, and the Co efficients $a, b, c,$ *&c.* will be determin'd, except the firſt a which may be taken at Pleaſure, and gives accordingly, all the different Species of Logarithms.

XI. *An Account of the Appearance of an extraordinary* Iris *ſeen at* Cheſter, *in* Auguſt *laſt, by* E. Halley.

ON the Sixth Day of *Auguſt* laſt, in the Evening, between Six and Seven of the Clock, I went to take the Air upon the Walls of *Cheſter*, when I was ſurprized by a ſudden Shower, which forced me to take Shelter in a Nich that afforded me a Seat in the Wall, near the North Eaſt Corner thereof. As I ſat there, I obſerved an *Iris*, exceedingly vivid, as to its Colours, at firſt on the South Side only, but in a little Time with an entire Arch; and ſoon after, the Beams of the Sun being very ſtrong, there appeared a ſecondary *Iris*, whoſe Colours were more than ordinary Bright; but inverted, as uſually: that is, the Red was inwards, which in the primary *Iris* is outward, and *è contra* for the Blues. But what I took moſt Notice of was, that with theſe Two concentrick Arches, there appeared a Third Arch, near upon as bright as the Secondary *Iris*, but coloured in the Order of the Primary, which took its Riſe from the Interſection of the Horizon and Primary *Iris*, and went

croſs the Space between the Two, and interſected the Secondary, as in the Figure *AFCG*. interſects the Secondary *Iris EFGD*, dividing the Arch *ED* into Three equal Parts, as near as I could then gueſs: but at firſt the Arch *AF* did not appear, which afterwards became as bright as the former. I obſerved the Points *F* and *G* to ariſe and the Arch *FG* gradually to contract, till at length the Two Arches *FHG*, and *FG* became co-incident; when for a great Space, the Secondary *Iris* loſt its Colours, and appeared like a White Arch at the Top. I obſerved alſo, that at the Points *F* and *G*, the Interſection of the Interior Red of the ſecondary *Iris*, and the exterior Red of the Arch, was much more intenſely Red than the outward Limb of the Primary *Iris*; and that during the whole Appearance, the upper Part of the third *Iris* was not at all viſible, beyond the Interſections, *F*, *G*. This uncommon Sight entertained me for about Twenty Minutes, when the Clouds blowing away, the whole Vaniſhed. I was at firſt amazed with the Sight, but afterwards, recollecting that the Sun ſhone along the River *Dee*, which from thence empties it ſelf into the *W.N.W.* where the Sun then was, I concluded, this Secondary Arch, *AFHGC*, was produced by the Beams of the Sun reflected from that Water, which at that time was very Calm; and it had been much more Bright had it been at that time about High, as it was Low Water, when all the Sands were bare. I was ſoon confirmed that my Suppoſition was Right, and that it anſwered all the Appearance without any Scruple, and that the Arch *AFHGC*, was no other than that part of the Circle of the *Iris*, that would have been under the Earth, bent upwards by Reflection; of which no more need to be ſaid. I remember not to have read of any ſuch *Iris*, in any Author I have hitherto met with, and though *Des Cartes*, in his *Meteors*, *pag.* 225. of the

Amſterdam

Amsterdam Edition, speaks of an inverted *Iris* by Reflection, I query whether ever any such has been really observed, at least it ought rather to appear a whole Circle, than a piece thereof: nor is it possible to be seen, as he describes it, when the Sun is less than Five and Forty Degrees high; in which Case, the Shade of the Cloud out of which the Rain falls, would be very apt to intercept the Beams of the Sun: and till some authentick Relation shall shew in what Circumstances it hath been effected, I must beg pardon if I still doubt the Appearance of any such Phenomenon.

On this Occasion, I can't forbear relating another Appearance I saw in *London* Streets on the 11th of *March*, in the Year 1696. It rained pretty thick a small Rain, and the Sun, about Two of the Clock, shone directly down *Abchurch-Lane*, as I was passing along it with my Back to him, when I perceived the Arch of the primary Rain-Bow in the Drops of Rain spanning the Street like an Arch of a Building, under which I was to pass; the Crown whereof was not much higher than my Head, and the diameter thereof scarce so wide as the Street, which is but 5 Yards; and it moved along with me as fast as I went; the Colours being very vivid and distinct, though the Arch it self appeared but narrow, and the Houses were every where behind it. This, tho' very uncommon, will not appear strange to those that have well considered the Nature of the *Iris*; but the Ancients who believed *Iris* the Messenger of the Gods, would have been apt to have thought she had some peculiar Message, when she placed her self so near me, as to be almost within reach: I understood her to invite me to inquire further into the Nature of her Production,

and accordingly, taking her under my Conſideration, I had all the Succeſs I could wiſh for, which perhaps may not be unacceptable to the Curious, if I publiſh in one of the next Tranſactions.

XII. *Account of Books.*

1. *Voyages and Diſcoveries in* South America: *The Firſt up the River of* Amazons *to* Quito *in* Peru, *and back again to* Brazil, *performed at the Command of the King of* Spain, *by* Chriſtopher D'Acugna. *The Second, up the River of* Plate, *and thence by Land to the Mines of* Potoſi, *by M.* Acarete. *The Third, from* Cayenne *into* Guiana, *in ſearch of the Lake of* Parima, *reputed the richeſt Place in the World, by M.* Grillet, *and* Bechamel. *Done into Engliſh from the Originals, being the only Accounts of thoſe Parts hitherto extant, with Maps.* London, *Printed for* Sam. Buckly, *at the* Dolphin *in* Fleet Street.

FAther *D'Acugna*, begins with a ſhort Account of ſome remarkable Attempts that had been made unſucceſsfully at ſeveral times by the *Spaniards*, to diſcover the River of *Amazons*; and then proceds to the perfect Diſcovery of it, by *Don Pedro de Texeira*, who in the Year 1637. ſet out from *Para* in *Brazil*, with 70 Portugeſe, and 1200 Indians in 47 Cances, and paſſing up the River with much difficulty, got to *Quito* in *Peru*:

The

The News whereof being ſent to the Viceroy of *Peru* reſiding at *Lima*, he ordered General *Texeira* to return to *Para* by the ſame way he came, and Two able Spaniards (of which our Author was one) to embark with him, to take an Account of the Courſe of the River, and the Country and People along it: and then to go to *Spain* to acquaint his Catholick Majeſty with their Diſcoveries. Accordingly they left *Quito* in *Jan.* 1639. and were Ten Months going down the River to *Para*. From thence *F. C. D'Acugna* went to *Spain*, and preſented the King his Maſter with an ample Account of what he had obſerv'd upon this great River, which was publiſhed at *Madrid*, 1641. but within a Year after, the *Portugueſe* making themſelves Maſters of all *Braſil*, and conſequently of the Mouth of the *Amazons*, it was judg'd neceſſary to ſuppreſs the ſaid Book, both in *Spain* and *America*, for the following Reaſon; the frequent ſacking of their Towns, and ſeizing of their Ships by the Engliſh, French, and Dutch, put *Philip* the Third upon ſearching out new Ways of Tranſporting the Treaſures of *Peru*, *Chili*, and *Granada*, into *Spain*; to which End (the Coaſts about, and in the Gulf of *Mexico*, being as well known as thoſe in *Europe*) orders were diſpatch'd from the Court at *Madrid* to the Governors of *Brazil* and *Peru*, to attempt the Navigation of the great River of *Amazons*, that if it were found practicable, the Gold, Silver, and other Merchandizes of *Peru*, and the adjacent Countries might be ſafely and commodiouſly ſent down to *Para*, to be put on board the Galleons, which would lie leſs expos'd there, than at *Cartagena*, *Porto Belo*, or *Vera Cruz*, the Soundings of the Mouth of that River being unknown, and dangerous to Strangers. Now the loſs of *Brazil* ſpoiling this Project, and no further Uſe being to be made of the Diſcovery by the *Spaniards*, they were not willing any other People ſhould beth e better

for

for it, and hence the Copy of this Book became so scarce that Mr. *Gomber Ville* says, there was not above Two in *Europe*, when he translated it into French, the Introduction to our English Version informs us, what Propoposals were made by the Count *de Pagan* to Cardinal *Mazarine*, in 1655. for Conquering and Planting this great River, but he, being involv'd in Domestick Troubles, was not at leisure to undertake it; nor has it been attempted since, by any *Europeans*. By the Account which Father *D'Acugna* gives of this River, it takes its Rise Eight Leagues from *Quito*, within Twenty Minutes of the Equinoctial Line, runs from East to West, coasting along the South Side of the Equinoctial Line, and is not distant from it, above Five Degrees, in the greatest of its Windings; the narrowest part of it is a Quarter of a League broad, in some Places it is One, in others Two, Three, and Four Leagues wide; and after a Course of above 1200 Leagues, discharges it self into the Sea, by a Mouth 84 Leagues broad, and is so deep, that a Ship of the largest Size may go up almost to its Source. Not to descend to particulars, he tells us in general, that the Country is Rich and Fertile, abounding in Corn, Wood, and Cattle, not without Mines of Gold; the Inhabitants numerous, handsom and ingenious, but different in their Language and Government. He has likewise taken Care to mark the Distances of Places all along the River, and what is peculiarly remarkable in each, either of the Inhabitants or Products of the Earth. In a Word, he has shewn himself perfectly qualified for the Business he was sent upon, which requir'd no less Sincerity than Accuracy and Judgment, and has given us a very entertaining Description of the noblest River in the World, and the richest Tract of Land in all *America* The Two other Voyages in this Book, were judg'd proper to accompany this, as describing Two other Large

Parts

Parts of *America*, whereof till now, we had but imperfect Accounts.

2. *Traite du Cancer, ou l'on explique ſa nature, & ou l'on propoſe les moyens les plus ſurs pour le guerir Methodiquement. Avec un examen du ſyſteme & de la pratique de Mr.* Helvetius. *Par Mr.* J. B. Alliot, *Conſeiller du Roy, Medecin ordinaire de ſa Majeſte, & de la* Baſtille, Paris, 1698. in 8vo.

THE Father of the Author of this Treatiſe, *Petrus Alliot*, who lived in *Lorrain*, and was Phyſitian to the Dukes of that Name in that Country, had made a particular inquiry into the Nature and Cure of Cancers and Cancerous Tumours. The King of *France* hearing of his Reputation at the Time when the Queen-Mother was troubled with this Diſeaſe, ſent for him to *Paris*, whither the Author came with his Father, and profited under him in the Management of this Diſeaſe. The Author, after ſome general Preliminaries, diſtinguiſhes Cancers into ſuch as are apparent or occult. He thinks the Cancer to come from Acids, and to be beſt cured by Alkalies, and abſorbing Medicines. He finds Fault with Monſieur *Helvetius*, for not underſtanding the Ancients, Moderns, or his own Syſtem of this Diſeaſe, and at laſt propoſes his Father's Method (which *Ettmuller* had ſome Notice of, as appears by Quotations in this Book) which is by a Medicine made of red Arſenick, or Realgar Powdered, and put into a very ſtrong Lixivial, the Diſſolution is power'd off by Inclination, it is filtrated, and to this Liquor is put Vinegar of Lead, till nothing precipitates. This Powder precipitated is ſweetned by Twelve or Fifteen times powring warm Water on it. The laſt Water ought to come off inſipid, then burn either pure Spirit of Wine, Five or

Six

Six times on it, or such to which is put a Tincture of Opium, then powder it, and it is ready for use. But both for the Reasonings on this Disease, and the Use of this Medicine, recourse ought to be had to the Book it self.

XIII. *A Catalogue of Books lately publish'd, not mentioned in these Transactions.*

MUseum regium, seu Catalogus rerum tam naturalium, quam artificialium, quæ in basilica bibliothecæ augustissimi Daniæ Norvegiæq; Monarchæ Christiani quinti Hassiniæ asservantur descriptus ab Oligero Jacobæo. Han. 1696. fol.

Godefridi Bidloo, vindiciæ quarundam delineationum anatomicarum contra ineptas animadversiones, Fred. Ruyschii. Lugd. Bat. 1697. 4to.

Frederici Ruyschii Responsio ad Godefridi Bidloi libellum cui nomen vindiciarum inscripsit. Amst. 1697. in 4to.

Christiani a Steenvelt dissertatio de ulcere verminoso. Lugd. Bat. 1697. in 4to.

Bibliotheca Hispana vetus, sive Hispanorum qui usquam unquamve scripto aliquid consignaverunt, notitia. Complectens Scriptores omnes qui ab Octaviani Augusti imperio usq; ad annum 1500. floruerunt. Auctore Nicolao Antonio, opus posthumum. Rom. 1696. fol.

Corpus pharmaceutico-chymico-medicum sive concordantia pharmaceuticorum compositorum, ad mentem clarissimorum, virorum hinc inde breviter illustrata. Studio & Opera Joannis Helfrici Jungken Physici Francofurtensis. Francof. 1697. 8vo.

Cours de Chymie par Nicolas Lemery. 9e. edition. Paris, 1697. 8vo.

Jo. Conradi Barchusen, pyrosophia, in tres partes divisa, quarum 1. Jatrochemiam; altera rem metallicam, 3. Chry-

3. Chryſopæiam breviter & ſuccincte perveſtigat. Lugd. Bat. 1697. 4to.

De naturali & præternaturali ſanguinis ſtatu medica ſpecimina Jacobi de Sandris. Quibus accedit diſſertatio de ventriculo & glandulis. Bononiæ. 1696. in 4to.

Joachimi Targiri Medicina compendiaria, in qua, propoſitis veterum ſententiis, nova & veriſſima artis medicæ forma ac ratio breviter, ac dilucide explicatur. Lugd. 1698. 8vo.

Joh. Chriſtophori Sturmii Phyſica electiva ſive hypothetica tomus jus ejus partem phyſicæ generalem complexus Norib. 1697. 4to.

Jo. Biſſelii è ſoc. Jeſu Argonauticon Americanorum, ſive hiſtoriæ periculorum Petri de Victoria ac Sociorum ejus libri XV. Gedan. 1698. 12mo.

Phlebotomia Liberata, ſive Apologia pro Sanguinis miſſione in Febribus, aliſque morbis magnis, qua reſpondetur Dominico la Scala Meſſanenſi. Accedit de Febribus diſſertationis prodromus in epiſtola ad Paulum Franciſcum Bruni. Genuæ. 1697. in 4to.

Lettera del, ſig. Abbate Michel Angelo Fardella in cui brevemente ſexammano è rigettano le oppoſizioni propoſte contro i principii della Carteſiana filoſofia dal dottiſſimo ſign Matteo Georgi nella ſua epiſtola detta ſaggio della nuova dottrina di Renato Carteſio, &c. Vinez. 1697. 8vo.

Les Hommes Illuſtres qui ont paru en France pendant ce ſiecle: avec leurs portraits au naturel. Par Monſieur Perrault de l'Academie Françoiſe. Paris, 1697. fol.

Theſe Books have been lately printed at the Theatre in Oxford.

DAvidis Gregorii M. D. & Aſtronomiæ Prof. Savil. Catoptricæ & Dioptricæ Sphæricæ Elementa. 8vo.

An Examination of Dr. Burnet's *Theory of the Earth, with ſome Remarks on Mr.* Whiſton's *New Theory, by* John Keill. *A. M. Coll. Ball.* 8vo.

Pindari Poemata Græce & Latine cum ſcholiis omnibus veteribus, paraphraſi Benedicti, lectionibus variantibus, verſione Nic. Sudorii J. C. & Chronologia Olympion. ſtudio *Ric. Weſt & Rob. Welſtead* A. MM. è Coll. Magd. in Folio.

Reliquiæ Spelmannianæ: *The Poſthumous Works of Sir* Henry Spelman, *Knt. Relating to the Laws and Antiquities of our own Nation. With his Life. By* Edm. Gibſon, *M. A. Fellow of* Queen's Coll. Fol.

Heptateuchum Anglo-Saxonicum, una cum fragmentis Ver. & Nov. Teſtamenti Anglo-Saxonicis, è Codicibus MSS. edidit *Edw. Thwaites*, M. A. è Coll. Reg. 8vo.

Anicî Manlî Severini Boëthî Conſolationis Philoſophiæ libros 5. Anglo-Saxonice redditos ab Alfredo Inclyto Anglo-Saxonum Rege, ad Apographum *Junianum* expreſſos edidit *Chriſtophorus Rawlinſon* è Coll. Reg. 8vo.

Elementa Arithmeticæ Numeroſæ & Specioſæ. In uſum Juventutis Academicæ. Auctore *Edw. Wells*, A.M. Ædis Chriſti Alumno. 8vo.

Annales Velleiani, Quinctilianei, Statiani; ſeu vitæ P. Velleii, M. Fabii Quinctiliani, Papinii Statii, (obiterque Juvenalis) pro temporum ordine diſpoſitæ. Auctore *Hen. Dodwello.* A. M. 8vo.

XIV. *Extracts out of divers late Accounts and Letters.*

AT *Geneva* are printing Two Volumes of Letters wrote to *Pereſcius.*

At *Lyons le P. Ote* has printed a Book called, *Theorie de la Marine.*

Monſieur *Tournefort* will ſoon publiſh at *Paris* a Book, called, *Hiſtoire des Plantes des environs de Paris*, in 8*vo.*

Monſieur

Monſieur *Magnol* has printed a Book of the Plants in the King's Garden at *Montpelier*. *Boccone*'s new Book of Plants, and other Phyſiological Matters is printed in 4*to*. at *Venice*. *Rivinus* has near finiſh'd his Third Tome of his Hiſtory of Plants. *Padre Faluggi*, at *Florence*, has put out *Proſopopeiæ Botanicæ*, in Verſe, dedicated to *Rivinus*. Dr. *Rammazzini* is publiſhing a new Edition of *Franciſcus Arioſtus de oleo Montis Zibinii*, with Notes and Obſervations. *Padre Cupanis panphyton Siculum*, is in the Preſs.

There is a new Monthly Account of ſeveral things not to be met with elſewhere, publiſh'd at *Venice*, call'd, *Galleria di Minerva*, there are Three of them already printed, and it will be continued.

At *Kilonium* in *Holſatia* in *Germany*, is inſtituted a new learned Society, whoſe Tranſactions, its ſaid, will be printed with this Title; *Acta Literaria Societatis Scrutantium in Academia Kilonienſi Sereniſſ. Princip. ac Dom. Dom Frederici Hered. Norveg. Regentis Ducis Sleſwicenſis Holſat. &c. Clementiſſimo indultu recens inſtitutæ, in quibus quicquid ad veram & elegantem literaturam, ſpectat, ſuccincte traditur Auctore Johanne Burchardo Majo Eloque & Hiſt. Prof. Primario.*

Monſieur *Bourdelot* at *Paris*, deſigns to publiſh a Treatiſe *de Scriptis Medicis*. And the late Dr. *Herman*'s *Paradiſus Batavus* is near finiſhed at *Leyden*.

The following Books are now in the Preſs, at the Theatre *in* Oxford.

Diſſertationes, de Uſu Cycli Metonici & Calippici, Civilis; de Cyclis Metone antiquioribus, & Cyclis Olympiadum Civilibus; de Cyclis Delphicis & Bœoticis; de Iſthmiis, & Cor. & Sic. Cyclis, &c. Auctore *Hen. Dodwello* A. M. 4to.

A

A Preservative against Socinianism: Part IV. By Dr. Edwards, *Princ. of* Jesus Coll. 4to.

Herodiani historiarum libri octo, Græce & Latine, cum Notis. 8vo.

Theocriti Idyllia, Græce & Latine, cum annotationibus & Scholiis veteribus. 8vo.

Spicilegium SS. Patrum, ut & Hæreticorum, Seculi post Christum natum I. II. & III. Quorum vel integra Monumenta vel fragmenta, partim ex aliorum Patrum libris jam impressis collegit, & cum Codicibus Manuscriptis contulit, partim ex MSS. nunc primum edidit, singulis Notitiam Scriptoris & Scripti præmisit, ac Notas in calce cunctorum subjunxit *Joannes Ernestus Grabe.* 8vo.

ADVERTISEMENT.

MR. Evelyn *being obliged to leave the Town some time before the* Copies *design'd for his Friends, could be corrected of some more obvious Faults (omitted to have been inserted among the rest of the* Errata) *desires the following* Notice *may be publish'd in these* Transactions; *as it should have been in the former Months, when an* Account *was given of his* Book, *had he known it was then a doing.*

Pag. 22. Line 2. *read*, mixt and *Obryze* sort also, which has on it a *horse*, rudely design'd; with the Letters CONOB. * *Constantinopoli Obrizatum*; Others, some prince of ours. p. 51. l. 9. read *Etiminius*. I know very well *Spanheme* slights this *Medal*; but I am not willing to degrade our Noble City of her so early *Metropolitan* Dignity, without a Demonstration, having a Learned Person on my side. p. 207. in *Margine*, read for *Richborough*, *Regulbium*.

* *In Auro Numismate Valentiniani Cæsaris. apud Constant, Landum Comitem, &c. Aldus* Notar. expla. p. 802. *Venet.* CIↃ.IↃ.XCI.

These, and some more, were unhappily left out of the printed *Corrigenda*.

ERRATA in *Philos. Transact.* Numb. 237. § 2. and Numb. 240.

PAG. 45. l. 7. r. *Portable Barometer*. In the Two Tables, *Jan.* 10. Col. 4. dele 2. 14. col. 4. for 68. r. 98. *Feb.* 9. col. 3. for 29, 90. r. 29, 10. *May* 25. for *Most* r. *Mist*. *June* 10. col. *ult.* for 0. 20. r. 01. *July* 21. col. 2. for *W. by W.* r. *W. S. W.* 22. col. *ult.* r. 0. 43. 31. col. *ult.* for 6. 19. r. 6. 09. *Aug.* 18. for *W. by S.* r. *W. S. W.* *Oct.* 20. dele *Rain.* 21. for *W. S.* r. *W. S. W.* *Dec.* 4. for *N. N. W.* r. *W. N. W.* 9. col. 3. for 53. r. 55.

PAG. 192. l. 26. for *Thereof* read *Therefore*.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

NATURAL HISTORY

Fig. 8.

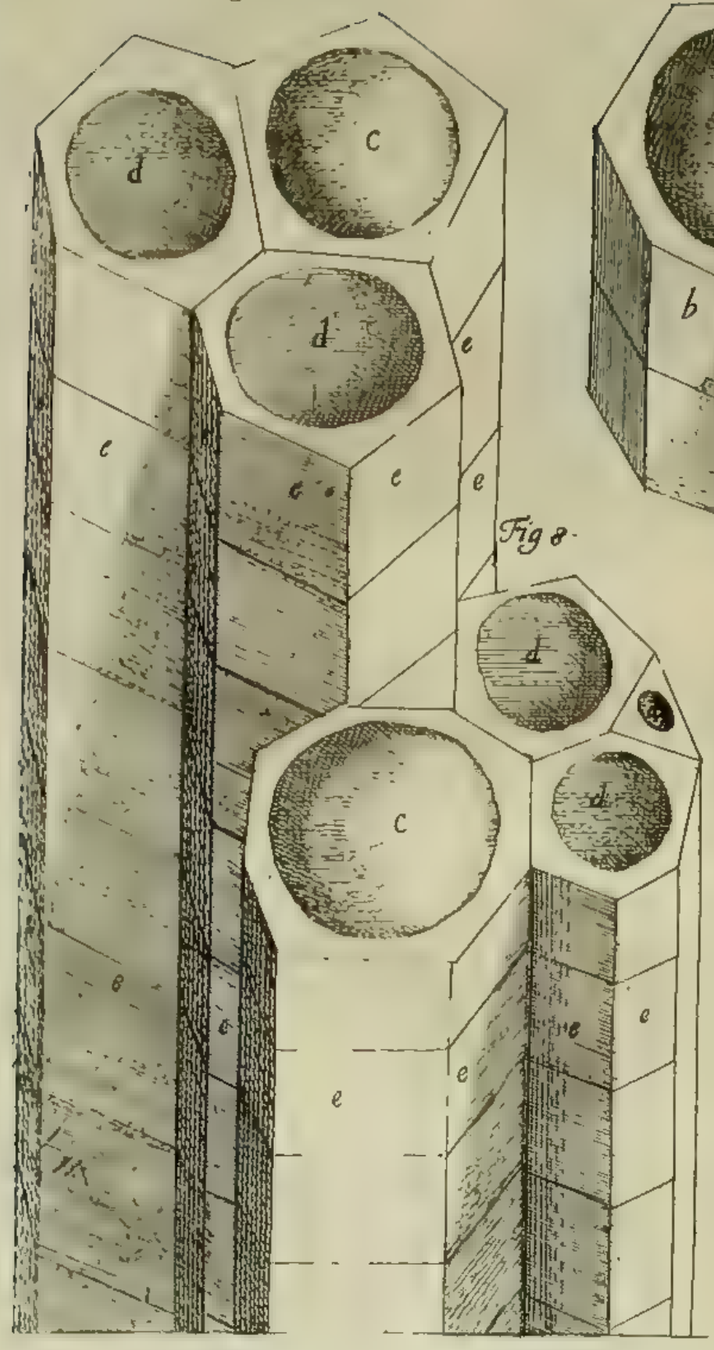


Fig. 7.

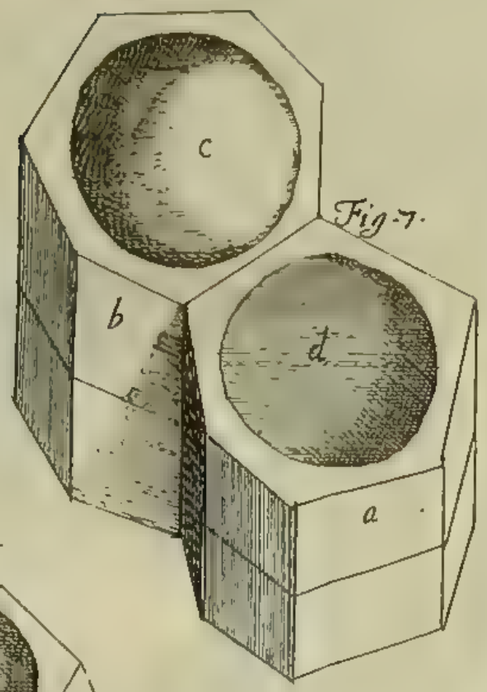


Fig. 6.

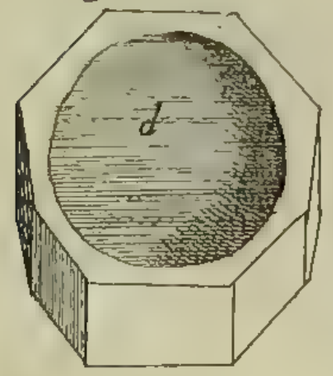


Fig. 5.

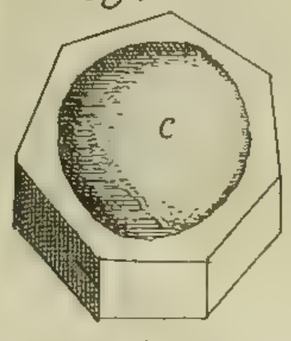


Fig. 9.

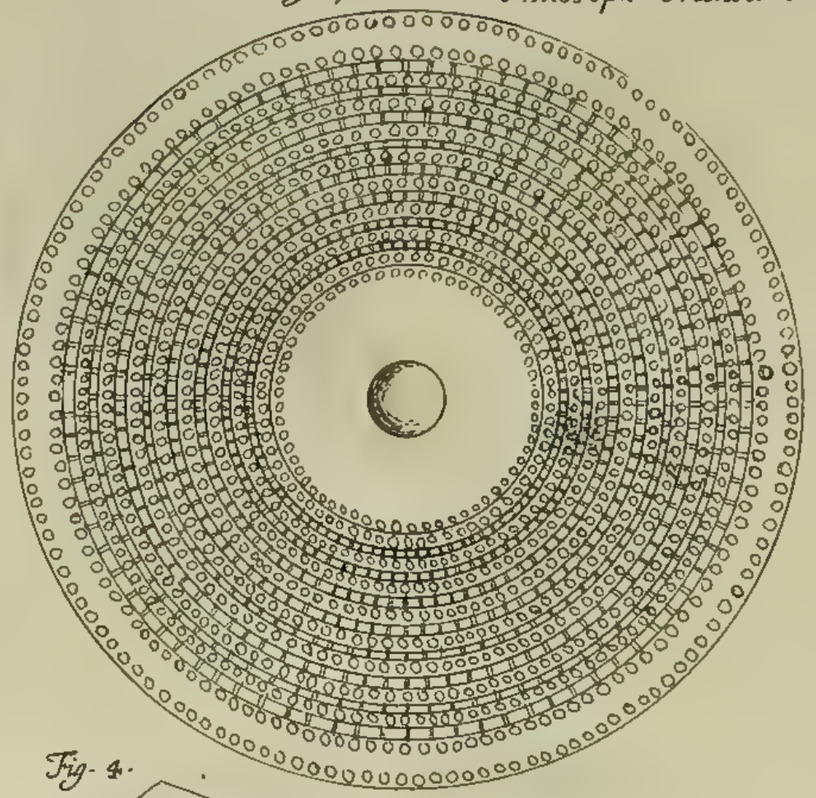


Fig. 4.

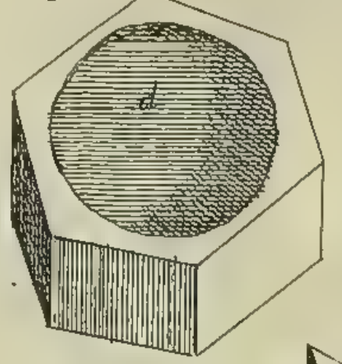


Fig. 3.

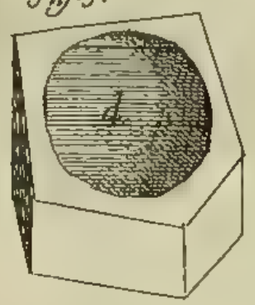


Fig. 2.

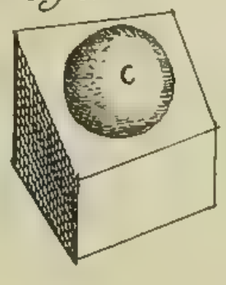


Fig. 6.

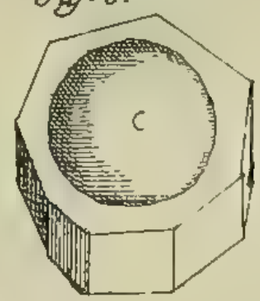
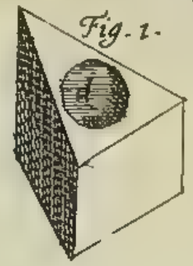
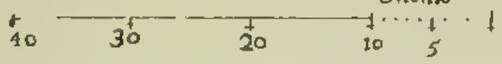


Fig. 1.





PHILOSOPHICAL TRANSACTIONS.

For the Month of May, 1698.

The CONTENTS.

I. *Part of a Letter from Mr.* Ralph Thoresby, *F. R. S. to Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians, and R.S. concerning a Roman Sheild.* II. *A Letter from Dr.* Thomas Molyneux, *to Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians, and R. S. Containing ſome additional Obſervations on the* Giants Cauſway *in* Ireland. III. *Epiſtola ſcripta à Raymundo Vieuſſens Doctore medico Monſpelienſi ad Clariſſimos Viros Societatis Regiæ Londinenſis, de Sanguine Humano. Communicated by Dr.* Will. Briggs, *Fel. of the Col. of Phyſ. and R.S.* IV. *Account of a Book,* La Meridiana del Tempio de S. Petronio, *&c. i. e. The Meridian Line of the Church of St.* Petronio, *drawn and fitted for Aſtronomical Obſervations, in the Year* 1655. *reviſed and reſtored in the Year* 1695. *by Signior* John Dominico Caſſini, *Primary Aſtronomer of the School of* Bononia *Pontificial Mathematician, of the Royal Academy of Sciences, and Fellow of the R.S. Printed at* Bononia 1695. *in Fol.* V. *A Catalogue of Books lately printed, not mentioned in theſe Tranſactions.* VI. *Extracts out of ſome late Accounts and Letters.*

I. *Part of a Letter from Mr.* Ralph Thoresby, *F. R. S. to Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians and R. S. concerning a Roman Sheild.*

SInce my former, having procured an old *Roman Shield*, of a different form from that I had before, and obſerving them both to be of different Materials from the uſual Deſcriptions of them (which I alſo apprehend to be in other parts de-

fective) I resolved to make a more particular Inspection into their Texture, and whereas they are generally said to be *è ligno, corio superinducto*, upon a strict Survey, there is nothing of Wood, but the Handle, in either of them. The Ancient *Romans* I observe had Three Words, *Scutum, Parma, & Clypeus*, for that defensive Weapon we generally English a *Sheild*, which notwithstanding their different Forms or Matter, their Authors (especially in the Declension of the Empire) frequently confound, as, if I mistake not, we do *Sheild, Buckler*, and *Target*. The *Scutum, & Clypeus*, in Form, *quæ enim rotunda, & in orbem justum relata, Clypeos dixere*, (and of this sort are those votive Sheilds upon the Colums or Trunk of Palm Trees, inscribed, VIC. AVG. or DAC. PAR. &c. in their old Coins) *quæ in longum exibant, Scuta*, both the *Scutum* and *Parma*, are by very good Authors, as well more ancient as modern, positively said to be of Wood covered with Leather, and so particularly Mr. *Ob. Walker*, in his late ingenious *Hist. of Coins*; but the ensuing Description will evince, that *Bernardus ipse non videt omnia*. This Sheild or Buckler is of the *Parma* Kind, and rightly so called, *quod è medio in omnes partes sit par*, whereas the *Scutum* was mostly Oval, tho' sometimes *imbricatum*, with Corners equally broad, it is Fifteen Inches Diameter, whereof a little more than a third part is taken up with the *Umbo*, or protuberant Boss at the Navel, which is made of an Iron *Convex* Plate, wrought hollow on the inside, to receive the Gladiator's Hand, upon the Center of this is a lesser Boss, wherein there seems to have been fixed, some kind of *Cuspis*, or sharp offensive Weapon, to be used when they came to fight Hand to Hand, but the Form of this I cannot describe, both the Sheilds being defective in that point; nor can I receive any Light from my Collection of Coins, for tho' it seem to be the same that *Mars Bellator* or *Gradivus* (for *Mars Quirinus* is not armed or marching) is usually described with, yet the Sheild being carried in the Left-Hand, only the Back Part of it is apparent. From the said *Umbo* the Sheild is Four Inches and an half broad on each side, in which are 11 circular equidistant Rows of Brass Studs of that Size, that *Vide Fig.* 9. 222 are set in the outmost Circle, which is 4 Foot wanting 3 Inches, (for that is the Circumference of the Buckler) and so proportionably in the lesser Circles to the Center of these 11 Rows of Brazen Studs, the inmost Circle is placed upon the

Umbo

Umbo it ſelf, the next 8 upon as many circular Plates of Iron, each a third of an Inch broad. The two outermoſt upon one thicker Plate an Inch broad: in the little Intervals between theſe circular Plates are plainly diſcovered certain croſs *Laminæ*, that paſs on the Back of the other, from the *Umbo* to the exterior Circle; and theſe Iron Plates are alſo about the third part of an Inch at the broader End towards the Circumference, but gradually contracted into a narrower Breadth, that they may be brought into the Compaſs of the *Umbo* at the Center. The inner Coat next to thoſe Iron Plates (for I cut it a little open behind, that I might more diſtinctly diſcern the Work) is made of very thick hard ſtrong Leather, which cuts bright, ſomewhat like Parchment. Upon that is a ſecond Cover of the ſame, and on the outſide of this are plaited the Iron Pins that run through the Braſs Studs; for the above-mentioned Braſs Studs are caſt purely for Ornament upon the Heads of the ſaid Iron Pins the ſixth part of an Inch long, that none of the Iron appears: this reminds me of *Julius Ceſar*'s Policy, who, as *Suetonius* tells us, countenanced this piece of Pride or Oſtentation in his Army, *ut Argento & Auro politis Armis ornaret, ſimul & ad ſpeciem, & quo tenaciores eorum in prælio eſſent, metu damni.* The next Cover to the plaiting of the ſaid Nails (which paſs through the circular and croſs Iron Plates, and both the Leather Covers) is a pure linnen Cloth, but diſcoloured, though perhaps not with Age only, but ſower Wine and Salt, or ſome other Liquid wherein it ſeems to have been ſteeped. And laſtly, upon the ſaid Linnen is the outmoſt Cover, which is of ſofter Leather, all which Coats that compoſe the Sheild, are bound together by two circular Plates of Iron, a thin and narrow one towards the Center, and a thicker and large one, an Inch broad at the Circumference, which is curiouſly nailed with two rows of very ſmall Tackets, above 400 in Number, the vacant Holes whence ſome of the Nails are dropt out, are little bigger than to admit the Point of a Pair of ſmall Compaſſes, both which Rims do likewiſe faſten the Handle (the only part of Wood) which has alſo Six other Iron Plates about three or four Inches long, to ſecure it.

That Sheild which I lately procured, differs not ſo much in Size (though it is compleatly a Foot larger in the Circumference) as in the Form, for whereas this already deſcribed is almoſt flat, except the ſwelling *Umbo*, this is abſolutely *Concave*, and

and from the Skirts of the protuberant Boſs in the middle, it riſes gradually to the Circumference, which is nigh three Inches perpendicular from the Center; this has Fourteen Rows of the like Braſs Studs, but the circular Plates of Iron they are fixed in, do not lie upon other croſs Plates, as the former does, but each from the Center, upon the outer Edge of the other, which occaſions its riſing in that Concave manner.

That theſe were part of rhe Acoutrement of the Roman *Equites*, rather than either the *Velites* or *Haſtati*, I conclude, becauſe that, though all in general had Sheilds, yet thoſe of the *Velites*, who were as the *Forlorn Hopes*, ſeem more ſlight, and are expreſly ſaid to be, *è ligno corio ſuperinducto*, thoſe of the *Haſtati* are not only ſaid, *e pluribus lignis & aſſerculis conſtit, &c.* but were alſo Four Foot long to cover the whole Body, when ſtooping; of which kind were likewiſe thoſe of the *Principes* and *Triarii*. Whereas the Deſcription that the Anonymous Author of *Roma Illuſtrata* with *Fabricius*'s Notes, gives in his *Armatara Equitum*, comes the nigheſt this, *Scutum ſive Parmam habebant ex bovillo corio, arte leviter durata*, but then he adds, *eoque mero, nulla materie ſubjecta*, omitting not only the ornamental Studs, but the Iron Work, which *Camillus* firſt contrived as a defence againſt the immenſe Swords of the *Gauls*. I have endeavoured to make this Deſcription more intelligible by a Draught of the Sheild above-mentioned. *Vide Fig.* 9.

Leeds, 26 *Febr.* 169⅞.

POSTSCRIPT.

HAving heard of ſome Roman Coins lately plow'd up about *Nottingham*, I procured a Parcel of them, but they prove common, and moſt of *Tetricus*, tho' ſome alſo of *Gallienus*, *Victorinus*, and *Claudius Gothicus*.

II. *A Letter from Dr.* Thomas Molyneux, *to Dr.* Martin Liſter, *Fellow of the Colledge of* Phyſicians, *and of the* Royal Society, *in* London: *Containing ſome additional Obſervations on the* Giants Cauſway *in* Ireland.

DIſcourſing lately with our Friend, Sir *Richard Bulkeley*, I find that for ſome while I have been under an Obligation by a Promiſe he made in my behalf, that I ſhould ſend you a more true and particular Account of the *Giants Cauſway*, than has been yet publiſh'd: and indeed had I been in Circumſtances that would have duly qualified me for the Performance of this Task; the Returns I owe for the great Civilities you ſhewed me when I was in *England*, were Ingagements ſufficient to have made me ready, 'ere now, and extreamly willing to imbrace an Occaſion, ſo luckily put in my way, of gratifying your Curioſity.

But I defer'd hitherto giving you this ſo ſmall a Teſtimony of my Thanks, by reaſon I was ſtill in Hopes, that one time or other, ſome convenient Opportunity would preſent, that I might take a Journey into thoſe parts of the Country where it lies, and ſo be able to diſcharge my ſelf of this Office more to my own as well as your Satisfaction; for being an Eye-witneſs of this rare and ſurpriſing Piece of Nature's inanimate Workmanſhip, I might by a more diligent Search and Ocular Inquiry, correct ſome Miſtakes and Overſights I find committed by thoſe that have already deſcribed it; and add to their Obſervations ſuch farther Remarks, as might render the Image and Notions we have of the *Giants Cauſway*, ſtill more Compleat and Circumſtantial.

And truly whoever takes a Pleaſure or Satisfaction in making Inquiries after Natural Productions, and examining the various Works of the Creation, cannot but be very deſirous if he has once heard of this *Foſſil*, to be as fully informed of it as 'tis poſſible, being 'tis ſo remarkably ſingular and curious in its Kind.

For if we conſider how admirable it is, either for its Angular and regularly Shaped *Columns*; or for the long Series of ſo many exact *Joints* in each of them; or for the neat and curious *Articulation* of theſe Joints one into the other; or for the vaſt *Height*, *Straitneſs*, and *Magnitude* of ſome of the Pillars, or for the great *Variety* as well as *Accuracy* of their *Geometrical Figures*; or for the ſtrange Combination of their *Sides*, in ſuch a Manner as there is not the leaſt Vacuity or Space left between one Column and another, they ſtand ſo cloſe together; or for the vaſt *Quantity* and ſpacious Extent of this ſort of *Rock*, which tho' it is found in ſuch an Abundance in this part of our Country, none of juſt the ſame Kind, for ought I can yet hear, is to be met with in any other part of the World: conſidering I ſay, all theſe Particulars, the *Giants Cauſway* of *Ireland* may very well be eſteemed one of the greateſt *Wonders*, Nature, or the firſt Cauſe of all things has produced.

For though 'tis true ſhe has manifeſted much greater Artifice and more curious Contrivance in the framing of *Animal* Bodies, and thoſe of *Vegetables*; as if theſe were deſigned to be more elaborate becauſe more obvious and expoſed to view and Obſervation; yet in the modeling of her *Minerals* that lie retired, more hid and concealed in the Bowels of the Earth, we ſhall not find ſhe has ſhewn any where ſo much Accuracy and Mechaniſm, as in the ſhaping the Materials of this our *Cauſway*.

How-

However my Affairs have ſo unhappily fallen out, and I have had ſo little command of my own Time of late, that hitherto I have been forced to deny my ſelf the Satisfaction of going to view this ſo curious a Natural Rarity in the Country where 'tis ſituated, and not being able to foreſee or promiſe my ſelf when it might be otherwiſe, I would not on this Score delay any longer anſwering your Expectations, and quitting my ſelf of the Ingagements I lie under; but reſolved at the Diſtance I am, to inform my ſelf as well as I could concerning it, and then ſend you the beſt Account I could gather from all my Intelligence; which I hope will not be altogether unſatisfactory.

Tho' I have collected from ſeveral Informations by me, many remarkable Paſſages concerning this ſtrange Pile of Stony Columns, yet I ſhall only here ſet down ſuch Particulars as have come to my Knowledge ſince my writing of thoſe Papers publiſhed in the *Philoſophical Tranſactions*, *Numb.* 212. to which I refer you, as well for the rectifying ſome Errors therein mentioned, as to avoid unneceſſary repeating what has been already ſaid on this Subject.

Perceiving then I could not ſo well rely on the Draught of the *Giants Cauſway* that was firſt taken, and printed about Four Years ſince in the fore-mentioned *Tranſaction*, as being done by the Hand of one who was no extraordinary Artiſt, tho' the beſt that could be then had; I propoſed the laſt Summer to ſome Philoſophical Gentlemen here in *Dublin*, that we ſhould imploy, at our common Charge, one Mr. *Sandys*, a good Maſter in Deſigning and Drawing of Proſpects, to go into the *North* of *Ireland*, and upon the Place take the genuine and accurate Figure of the whole Rock, with the natural Poſture of the Hills and Country about it for ſome diſtance, accordingly we ſent him away with ſuch In-

ſtructions as I drew up for him, and he returned ſoon after with a fair and beautiful Draught very expreſſive of each Particular we deſired; an exact Copy of which my Brother lately ſent over to the *Royal Society*, by one of their Worthy Members, and my highly eſteemed Friend, the Honourable *Francis Roberts*, when he went laſt from hence, this I believe you'll find hanging up in their *Repoſitory* at *Greſham-Colledge*, to which I muſt deſire you to have recourſe, for the whole *Map* was too large and bulky to be inclos'd in this Letter *: However, I have ſever'd from it one of its moſt inſtructive *Schemes*, as being the chief and moſt eſſential part of it all, and have here ſent it you; from whence with the Help of the Deſcription already publiſhed, you will eaſily frame to your ſelf a juſt *Idea* of the moſt ſingular and remarkable Properties of this Stone of the *Giants Cauſway*.

See the Table.

Here you have expreſt by the ſame *Scale*, all the various Figures of the ſeveral ſorts of *Joints* and *Colums* that have been found by late careful Obſervation to make up the *Cauſway*.

Figure 1. ſhews a Joint but of Three Sides.

Figure 2. a Joint of Four Sides.

Figure 3. a Joint of Five Sides.

Figure 4. a Joint of Six Sides.

Figure 5. a Joint of Seven Sides.

* A Figure of this is Printed, *Numb.* 235. of theſe Tranſactions.

Figure

Figure 6 and 7. Two Joints one of a ſmaller, t'other of a larger Size, that have both Eight Sides.

Figure 7, and 7. a piece of a Colum of Six Sides tranſverſely divided in the Middle, the uppermoſt Part *a.* laid cloſe by the lower Part *b.* that the Manner may the better and more plainly appear how the Convexity or riſing of the Joint below markt *c.* was let into the Hollow of the Joint above markt *d.* when that was in its native Poſture ſtanding a Top and covering it, by this ſort of Articulation the ſeveral Joints of the Columns, whether they conſiſt of Three, Four, Five, Six, Seven, or Eight Sides adapt and unite themſelves to one another, obſerve in all the reſt of the Figures *c.* denotes a Convexity or riſing, *d.* a Cavity or Hollowneſs in the Stone.

Figure 8, and 8. is a Collection of Seven Colums as they ſtand together in the *Cauſway,* and ſhews that tho' the Pillars differ from one another in their Shape and Angles, yet they adjuſt their Sides in ſuch a Manner to the next immediate adjoining Colums, that there remains no Vacuity between them, for the Pillars are of ſuch various Figures, that all ſorts of Interſtices of what ſhape ſoever, are intirely fill'd up by one or other of them.

e.e.e.e.e.e. The Sides of the Pillars which ſhew by their outward Surface, that each Colum conſiſts of many Joints placed one above another from Top to Bottom; and theſe Joints ſo cloſely contiguous, that only a ſmall Creviſe or Line ſeems to ſever them; ſome with their Convexities uppermoſt as thoſe markt *c.* others with their Concavities as thoſe markt *d.*

Theſe

Theſe Figures make out there was a Miſtake committed as well in anſwering one of the *Queries* relating to this *Cauſway*, as in the Account that's given of it; where 'tis ſaid, that among the Colums *there are none ſquare but almoſt all Pentagonals or Hexagonals, only a few are obſerved that have Seven Sides, but more Pentagons than Hexagons*, whereas 'tis certain, there are not only in this Pile *Quadrangular*, but alſo *Triangular* and *Octangular* Pillars, though no Notice was taken at that time of any ſuch, by reaſon they are much fewer in Number than thoſe other figured Colums, and not being carefully ſearched after, they did not come ſo readily in Sight, and my very honoured Friend, Dr. *St. George Aſh*, now Lord Biſhop of *Clogher*, aſſured me, that when he was on the *Cauſway*, he could not by all his Obſervation, tho' he examined the Matter ſtrictly too, diſcover there were more Pentagons than Hexagons.

But this ſort of Stone is not more remarkable for being cut thus naturally into regular Geometrical Figures, than for being found in ſuch Plenty and vaſt Abundance in many parts of this Country, for Four or Five Miles about. Other curiouſly ſhaped Stones as the *Trochites*, the *Aſtroites*, the *Lapides Judaici*, the *Echinitæ Pellucidi*, and ſuch like, whereſoever diſcovered in the World, are always but few in Number, and only met with in ſmall Parcels, ſcattered and diſperſed up and down: But Nature has framed ſuch an immenſe Quantity of this prodigious Stone here altogether, that ſhe ſeems more than ordinary profuſe of her elaborate Workmanſhip.

For beſides what goes under the vulgar Name of the *Giants Cauſway*, which it ſelf alone is of a great Extent, at leaſt Seventy Five Foot longer than what 'twas firſt ſaid to be, and how much farther it may run into the Sea,

Sea, none can tell; there are many other Collections of the ſame kind of Pillars, ſituated in and about this Place, as two leſſer but more imperfect and broken *Cauſways*, as we may call them, that both lie at ſome Diſtance o'the Left Hand of the great one, as you face the *North*: and a little farther into the Sea, ſome Rocks ſhew themſelves above Water, when the Tide is low, that ſeem all made ſtill of the ſame Stone. And if you aſcend towards the Land in the Hill above the *Cauſway* next and immediately adjoining to it, you meet with more of the ſame ſort of Pillars, but in a different Situation, not perpendicular and erect, but lying as 'twere on their Sides, in a ſlanting Poſture.

Beyond this Hill Eaſtward, at ſeveral Diſtances ſtand many ſets of ſtreight and upright Colums ranged in curious Order along the Sides of the Hills: that Parcel of them which is moſt conſpicuous and neareſt the *Cauſway* the Country People call, the *Looms* or *Organs*, from its formal Shape; which is ſo very regular, that all its ſeveral Pillars may be diſtinctly counted, and they are juſt Fifty in Number, the largeſt and talleſt at leaſt Forty Foot high, conſiſts of Forty Four diſtinct Joints, and ſtands directly in the middle of all the reſt, they gradually decreaſing in Length on both Sides of it, like *Organ Pipes*.

Four Miles Weſtward of the *Giants Cauſway*, a Mile and a half diſtant from the Sea, Three Miles from the Town of *Coleraine*, and about Two from *Dunluce*, an old Seat of the *Marqueſſes* of *Antrim*; ſeveral Ranges of tall Pillars ſhew themſelves alongſt the Side of a Rock for about Three Hundred Paces together: a Church within a Quarter of a Mile of them, called, *Ballywillan-Church*, I am told was built for the moſt part with Stone taken from theſe Pillars, which are all of the ſame ſort of Stone with the Colums of the *Giants Cauſway*, (as I find by care-

carefully examining and comparing together Pieces of them both I have now by me) and like thoſe too, conſiſt of regularly cut, looſe, and diſtinct Joints, placed one upon the Top of t'other, but in theſe Reſpects they differ:

1. That ſome of theſe *In-land Pillars* are of a much larger Size than any in the *Cauſway*, being Two Foot and a half in Diameter:

2. That there are only found among theſe ſuch as have Three, Four, Five, and Six Sides, none that have Seven and Eight like ſome of the *Giants Cauſway*.

3. That the Joints of theſe do not obſerve that knd of Articulation by *Cavities* and *Convexities* as thoſe of the *Cauſway* do, but their upper and lower Surfaces touch only in *Planes*, and they ſtand united by means of their Weight and Preſſure alone, ſo that a ſmall Force will ſever them.

Whether theſe Particulars may be thought ſufficient to conſtitute a ſpecifick Difference, or only an accidental Variety between the Stone of the *Giants Cauſway*, and of theſe more *In-land Pillars*, I leave to your greater Experience in theſe Inquiries to determine.

But in the mean time I muſt not omit informing you, that notwithſtanding thoſe regular *Cavities* or *Riſings*, you ſee expreſt in the Middle of every one of the Joints of the *Cauſway*, deſcribed in the foregoing Table, and though I have been aſſured by ſeveral that have been upon the Place, that the like *Hollows* and *Convexities* are in the Original Stones themſelves; yet I find by obſerving the Manner of the Commiſſure or way of Articulation in Six Couple of the ſeveral ſorts of Joints of Three, Four, Five, Six, Seven, and Eight Sides, which I had raiſed on Purpoſe, and taken out of the *Cauſway*, as they were there naturally fellow'd in Pairs, and was at the

Charge

Charge of having them ſent hither to *Dublin*, that I might have a compleat Set and Sample of all the various Colums the *Giants Cauſway* affords; I ſay, obſerving of theſe, I find ſome of the Joints actually want this *Cavity* and *Riſing*, as thoſe of Four and Six Sides I have now in my Houſe, and are only united to one another by Superficies touching cloſe in Planes that run a little ſlanting and not parallel to the *Horizon*. Yet this may be only a chance Formation, ſince the univerſal Jointing of the whole *Cauſway*, is certainly otherwiſe; but I muſt take notice, that the *Hollows* and *Convexities* are not conſtantly formed and moulded in the Stone with all that Accuracy and circular exactneſs the Artiſt has pleaſed to expreſs them in the Figures.

Theſe Cavities in ſuch Joints as are uppermoſt, and lye expoſed to the open Air on the Surface of the *Cauſway*, afford no ſmall Uſe and Advantage to the poorer ſort of the People in the Neighbouring Country, with whom it is a common Practice in the Summer time, when they want Salt, to fill theſe natural Baſons with Sea Water, which by reaſon of their Shallowneſs are of ſo commodious a Shape, that in the Space of Four *Tides* they find all the Water that was left in them exhaled, and the Salt remaining dry in the bottom of the Hollows. Yet whether ſome intrinſick Principle in the Nature and Body of the Stone may not contribute a great deal, as well as the outward Figure of its Cavity, to ſuch a ſudden Evaporation of the Water, and Chriſtaliſation of the Marine Salt, in ſo Cold and Northern a Climate as this is, I leave to be further conſidered.

But there is another Irregularity I muſt take Notice of, which is, that One of the Joints of the *Cauſway* a Pentagon ſent me hither to Town, is Cavous, both at Top and Bottom: and I am told, among the other Figured Joints likewiſe, there are often found thoſe that

are Convex as well at Top as at Bottom: But the general Formation that's moſt conſtant and runs through almoſt all the Pillars of the *Cauſway*, agrees with what is ſaid in the fore-mentioned *Tranſaction, viz. That if a Joint be Concave at one End, the other End is always Convex.* And bating theſe Particulars I have hinted, I do not ſee any thing elſe ſaid in that Account that you may not ſafely rely on.

The vaſt Towering Height of theſe ſtrait Jointed Pillars, eſpecially of thoſe that are moſt ſlender and the perfecteſt among them, is truly very ſurprizing, and deſerves yet a more particular Regard. There are in the *Cauſways*, ſome of Thirty Two, others of Thirty Six Foot High above the Strand, and as I ſaid before, ſome among the *Organs* equal Forty Foot in Height: How far theſe may be continued under Ground is not yet diſcovered, nor has it been ſo well examined as it ought: A Gentleman of my Acquaintance in thoſe Parts, did me the Favour lately to trace one of the talleſt Pillars of the Cauſway, by digging into the Strand till he could well go no farther; and it continued ſtill of the ſame Make and Figure, Jointed as it was above, for the Depth of Eight Foot together, and could he then conveniently have gone on with his Deſign, and followed it deeper, he tells me he had no Reaſon to doubt but he might ſtill have traced it much farther into the Earth. This is obſervable, that commonly the Joints as well of the *In-land Pillars*, as thoſe of the *Cauſway*, as they have their Situation nigher the Earth, are longer and taller than thoſe towards the Top of the Colum, but no difference is obſerved in the Cavities or Riſings of the Joints, as they are placed higher or lower in the ſame Pillar, they continue much the ſame as to their Depth or Protuberance from Top to Bottom: yet the utmoſt Top of ſuch of the Pillars that ſeem compleat and intire, always terminates

nates with a Joint that's flat on the upper Side, and no way either Concave or Convex like all the reſt below it.

By what means theſe Stony Joints, ſo Ponderous and Bulky, and ſo diſtinct and diſcontinued Bodies from one another, ſhould arrive at firſt to this great Height, and reach the Summits of theſe tall Colums where they now are placed, ſeems a Problem of that difficulty, that ſome perhaps for its Solution may be apt to think they were co-æval with the firſt Creation, and ranged then in the ſame Order they now ſtand by the great *Fiat* that produced the World. But it were eaſy to give another Conjecture of this odd Appearance, were I not better pleaſed to obſerve and ſet down the Hiſtory of Nature as it truly is, than to amuſe my ſelf and others by making vain and uncertain Gueſſes at the hidden Cauſes of its *Phænomena.*

As to the internal Subſtance of this Stone, 'tis of an extraordinary hard, cloſe, and compact Texture: its *Greet* or *Grain* ſo very even and fine that it hardly appears, unleſs viewed near the Eye, and when the Stone is newly broke; then it ſhews its ſelf on its Surface like a very minute ſmall gliſning Sand thickly interſperſed with the reſt of the ſolid; which by reaſon its parts are ſo firmly combined together, has ſomething more of Gravity in Proportion to its Bulk, than moſt other ſorts of Stone, unleſs ſuch as partake of the *Marchaſite* or *Pyrites*, and are more ponderous than uſual from a Metalline Principle being an Ingredient in their Compoſition; of which this does not at all participate or at leaſt not in any conſiderable Quantity that I can diſcover.

It ſeems as as if it were one plain Homogenious Body, without any Mixture of *Cochlite*, *Belemnite*, Veins of *Spar*, or ſuch like extraneous Matter, ſo commonly met

with in moſt other ſtony Concretes: nor can there be obſerved Rays, Furroughs, Striæ, or any manner of Lines running along its Superficies; ſo that it is capable of a good Polliſh, and I find has in Perfection that Quality of the *Lapis Lydius*, *Baſanus* or *Touchſtone*, ſo much celebrated of old, for ſhewing the various Impreſſions different Mettals make upon it when rub'd or drawn along its Surface; but being a Stone naturally divided into ſmall Pieces or Joints, and of ſo hard a Body, that it turns or breaks the Edges of the beſt Tools, when they offer to cut it; it ſeems unfit for the imbelliſhing of Houſes, and all the other greater Uſes of Architecture and Statuary.

Its Ruff and natural Outſide that's expos'd to the open Air and beating of the Weather, is of a whitiſh Colour, much the ſame with that we ſee on common *Rocks* and *Lime Stone*; but the Inſide, when you ſever one Piece freſh from another, is of a Blackiſh Iron-grey, like that of the beſt Black Marble before 'tis poliſhed, but ſomewhat of a darker Shade.

And indeed I can diſcover but little, if any, Difference between the Subſtance of this Stone, and that of Marble: 'Tis true, the moſt common ſort of Marble is not near ſo hard and cloſe a Body; yet that does not import much, ſince 'tis known that ſeveral Kinds of Marble vary extreamly from one another in theſe Reſpects; for which we may take *Pliny*'s Word, *Hiſtor. Natural. lib.* 36. *cap.* 7. *Marmorum Genera & colores non facile eſt enumerare cum ſint in tantâ Multitudine:* and a little farther in the ſame Chapter, ſpeaking more particularly of the various Kinds of Marble, he mentions one ſort of it found in *Æthiopia*, *Quem vocant Baſalten ferrei coloris atque duritiæ unde & nomen.*

And

And truly the Stone of our *Giants Cauſway* agreeing ſo well in Hardneſs, Colour and Subſtance with this *Æthiopick* Marble deſcribed by *Pliny*, and *Kentmannus*, reducing a ſort of *Pillard Stone* in *Miſnia* near *Dreſden* in *Germany*, that nearly reſembles ours in many of its Properties, to the *Baſaltes*: I thought I could not more aptly refer it to any *Species* of *Foſſil* yet known, than to that, and therefore gave it the Name of *Lapis Baſaltes, vel Baſanus Hibernicus*, but not being ſo well informed then, I ran into a Miſtake, when I ſaid, *Angulis minimum quinque plurimum ſeptem conſtans*; whereas I ſhould have ſaid, *Angulis minimum tribus plurimum octo conſtans*; And this ſhews it to partake ſtill more of the Nature of the *Miſnian Baſaltes*, tho' it comprehends Two ſorts of Pillars which that has not, thoſe of Three and thoſe of Eight Sides.

This puts me in Mind of taking Notice to you, that I cannot but think that Gentleman extreamly out, whoever he is, for he conceals his Name, and perhaps would have done well had he his Opinion too, that publiſh'd a Paper, *Number* 23. *Page* 46. in the *Monthly Miſcellaneous Letters*, where he ſays, the Stone of the *Giants Cauſway* (which I am confident he had never ſeen) *might rather be referr'd to the Entrochi than to the Lapis Baſaltes or Baſanos.* Now the *Entrochi* you know are Cilyndrical Bodies, and never Angular, always of a ſmall Size, the largeſt not above an Inch Diameter, and their Solid quite of another Subſtance, a ſoft britly Matter, much of the ſame Grain and Texture with the *Lapis Judaicus*: which are ſuch ſignal and eſſential Characters to diſtiſtinguiſh it from the Stone of the *Cauſway*, that nothing would be more abſurd in *Natural Hiſtory*

ſtory, than to reduce Two Minerals ſo vaſtly different, to one and the ſame *Tribe*; whereas I find no Diſagreement that's conſiderable between the Colums of the *Baſaltes Miſenus* and thoſe of the *Baſaltes Hibernicus*, but that the former are made of One entire Stone, which in the latter is divided into Joints; and this I take as Grounds only ſufficient to conſtitute a bare ſpecifick Difference, and no more.

Georgius Agricola in his Book *de Natura Foſſilium*, *lib. 7. Pag.* 327. has a Paſſage (and which I find confirmed too, by a later Author living in that Country, *Lachmand de Foſſilibus*, *&c.*) wherein he mentions a ſort of Marble found in the Deſtrict of *Hildeſheim* in *Germany*, that ſeems to bear in ſeveral Reſpects, a great Analogy or Agreement with this Stone of the *Giants Cauſway*, becauſe they are but ſhort, I'll give you his own Words; *In Hildeſheimo quoque è Regione Arcis Marieburgi Collis eſt plenus Lapideis Trabibus, quarum Capita interdum eminent, ſunt vero perlongæ acervatim poſitæ inque medio earum terra eſt colore Nigro, ferro aut altero Lapide percuſſæ non aliter ac marmor Hildeſheimum cornu uſti virus olent omninoque ex eadem Materiâ ſunt.* He does not indeed tell us the preciſe Figure of theſe Marble Beams, yet it ſeems probable at leaſt that ſome were Square, which makes him call them, *Trabes Lapideæ*. But however that might be, this I'm aſſured of from frequent Experiments, that the Marble of the *Giants Cauſway*, like theſe *Stony Beams*, when forcibly ſtruck with another Stone or a Bar of Iron, ſends forth a ſtrong offenſive Scent like Burnt Horn.

But

But I ſhall forbear making any more of theſe kind of Remarks or raiſing Deductions from them, conſidering that I write to one whoſe accurate Obſervations, vaſt Reading, and ample Experience in Foſſils, can, if he pleaſe, furniſh me with thoſe that are ſo much more Inſtructive and Judicious than my own: and ſhall therefore add no more, but intreat you to let me know your particular Senſe of this wonderful Product of Nature, and your impartial Cenſure of what I have ſaid concerning it; and then I ſhall quite accompliſh all that I propoſed to my ſelf by troubling you with this, the acquiring Knowledge, and ſhewing you that I am,

Dublin, March 25. 1698. *YOUR's*, &c.

III. *Epiſtola*

III. *Epistola scripta à Raymundo Vieussens Doctore medico Monspelienſi ad Clariſſimos Viros Societatis Regiæ Londinenſis, de Sanguine Humano.*

VIRI CLARISSIMI,

CUM mihi Rex ob edita in Lucem opera quædam medica penſionem annuam Librarum mille ad vitam die vigeſima tertia Menſis Septembris Anni 1688. liberaliter conceſſiſſet, egoque tanto beneficio vehementer, ut par erat, commotus eſſem, nihil mihi prætermittendum eſſe exiſtimavi, ut ne principis omnium maximi favore, atque gratiâ indignus videri poſſem. Quamobrem publicæ ſalutis ſtudio magis ac magis accenſus ſtatim cæpi quantùm potui temporis mihi, meiſque rebus ſubducere, ut me totum conferrem ad amplam, accuratamque morborum internorum hiſtoriam contexendam, non eam nudam, & ad curioſitatem tantùm compoſitam, ſed cauſarum, nec non ſymptomatum explicationibus in mechanica humani corporis ſtructura fundatis, & aſſiduis meis, jam ab annis fere triginta, humanorum corporum in xenodochio Monſpelienſi diſſectionibus ornatam & conſtitutam.

Magnum ſanè, arduum, & ſtupendum, ut ita dicam opus, quod cùm fere tribus abhinc annis recognoviſſem, & æqua Lance perpendiſſem, corrigendum, augendumq; ratus ſum; imò ſtatuendum, & clare demonſtrandum in ipſo limine operis, quæ ſit eſſentia, quæ vis eorum corporum, quibus ſanguis conſtat, tum quod majus eſt, quæ tandem inter illa reperiatur proportio quantitatis, quod niſi ante omnia eſſem aſſecutus, in ipſa humani temperamenti naturâ; differentiis, cauſis, ſignis, effectibus,

bus, & mutationibus cognoſcendis fruſtrà omninò, meâ quidem ſententiâ, elaborarem.

Relictâ igitur ad tempus, Viri Clariſſimi, interiorum corporis morborum hiſtoriâ, in ſanguine contemplando curas omnes meas, & cogitationes ita defixi, ut nullo modo mihi priùs quieſcendum putarem, quàm totam liquoris illius naturam penitus attigiſſem, ipſiſque, ut ita Loquar, oculis omnium ſubjeciſſem partes ejus omnes, partiumque omnium eſſentiam, qualitates, & gravitates reſpectivas, atque adeo naturalem unius cujuſque ipſarum quantitatem (corporum autem quantitatem ſuî gravitate, & pondere metior ſiquidem quantitas, non apparens quidem & ſenſibilis, ſed realis & phyſica ponderi ſemper ex æquo reſpondet). Quamvis enim ſumma difficultate operis admodùm terrerer; tamen tentandi gloriâ, ſtudioque boni publici adhuc vehementiùs commovebar neque inanis ſpes, aut irritus conatus fuit; nam (quod Dei profectò gratia eſt) Clariſſimi Boylæi nunquam ſatis laudandi veſtigiis in hoc ſuſcepto meo inſiſtendo, & ulteriùs quàm ille progredi, ſi poſſem, conando, quod diu, multùmque optaveram, vixque ſperare auſus eram, id tandem, quamvis non ſine gravibus longiſque laboribus, conſecutus ſum. Quò jam chymici, medicique illi (abſit verbo invidia) prorſus erraſſe mihi videntur, qui illud quod è ſanguine ſal elici ſolet, merum ſal acre, ſeu alkalinum eſſe, nullâque induſtriâ verum ſal acidum ex illo educi poſſe hactenus crediderunt. Ii pariter tum chymici, tum medici erravere, qui eam, quam à natura partes vivifici hujuſmodi liquoris inter ſe habent, proportionem quantitatis nullâ reperiri poſſe arte ab elapſis tot ſeculis judicaverunt.

Equidem ſcio, & fateor ſal ſive volatile, ſive fixum ignis vi extractum è ſanguine fermentationem, quod ajunt, cum fluoribus quibus vis acidis etiam mitioribus pati: præterea id ipſum ſal ſublimatum corroſivum diſſolutum præcipitat, & ſyrupum

violaceum viridem facit, ut nemo nescit, adeòque multas salino-acres, seu alkalinas habet particulas, quibus hæc præstat ; sed salinas quoque acidas non paucas complectitur, ut adducendis modò in medium experimentis constabit certo certiùs : Quamobrem illud esse à natura sua verum corpus salsum exploratum deinceps omnibus erit, ac cognitum, nec non extra omnem omnino controversiam positum. Corpus salsum, cum dico, conflatum intelligo ex partibus quidem salino-acribus & salino-acidis, sed salino-acribus longè pluribus : ex quo illud consequens est, ut integrâ inviolatâque naturâ salino acidæ majore salino-acrium copiâ obrutæ, & quasi sepultæ delitescant.

Cùm Sal acidum, sub forma silicet spiritus acidi eruere vellem, si fortè possem ; è salso sanguinis, quod jamdiu in innatum, & adventitium, seu ab alimentis potissimùm suppeditatum divisi, ut cap. 22do libri mei de principiis fusè nec non clarè explicui : libras quinquaginta ejusmodi liquoris priùs œneo in vase ignis vi, quantùm par erat exsiccati per totas viginti quatuor horas in fornace figuli torrui, seu, ut aiunt calcinavi ; adeòque illas ad tres uncias, & drachmas septem cineris grisacei redegi : ex hoc cinere gustui valdè aspero, cum spiritibus acidis fermentescente, & tincturæ florum maluæ viridem colorem inducente lixivium confeci, ex quo unciam unam salis fixi candoris penè nivei eduxi : Salis illius, quod, ut supra dictum est, cum omnibus spiritibus acidis fermentescebat, sublimatum corrosivum dissolutum præceps agebat, & syrupum violaceum colore viridi tingebat, septem drachmas, & quadraginta duo grana tribus circiter unciis boli siccissimi admiscui : ex mixto hujusmodi retortâ luto munitâ incluso igne, ut aiunt reverberii extraxi semiunciam & grana octodecim spiritus colorem spiritus sulphurei quodammodò imitantis, & ipso spiritu aceti acidioris linguæ judicio.

Spiritus ille plurimùm fermentatur non solùm cum oleo, & sale fixo tartari, verùm etiam cum sale sive fixo, sive

ſive volatili, & ſubruſo ſpiritu, quæ ignis vi extrahuntur è ſanguine. Prætereà ipſemet ſpiritus rubefacit ſyrupum violarum, tincturam heliotropii & florum maluæ. Quare liquidò conſtat ſal ex ſanguine humano extractum debere credi verum ſalſum; id eſt ſalſum ac quoddam acre-acidum. Quod omnia inter ſalſa perfectam cum ſolo ſale fixo tartari, en nullam cum ſale marino, ſive odore, ſive ſapore, ſive dentium ſtupefaciendorum vi, ſive aliis quibuſvis effectibus ſuis ſimilitudinem habere videtur, ut experientia demonſtrat. Unde patet ulteriùs extractionem ſalis acidi ex eodem ſanguine difficilem adeò hactenus ab omnibus exiſtimatam re ipſâ fieri, ſi docta, peritaque manus non deſit.

Extracto & quaſi per vim anulſo ſpiritu illo, de quo jam dixi, ex intimis viſceribus ſalis fixi, ubi concluſum, penitúſque obrutum latitabat, ſub forma ſolidi quidem corporis, ſed tamen in partes exiguiſſimas diviſi, confectum eſt à me lixivium è reſidua in fundo vaſis materiâ, ex quo binæ drachmæ cum dimidia, & grano uno ſalis fixi griſacei ſubalbeſcentis eductæ fuere: iſtud ſal cum nullo liquido acido, ſaltem ad ſenſum fermenteſcebat, ſi oleum vitrioli excipiatis; id tamen ut ſal acre, ſive alkalinum purum, aut ferè purum ſpectandum eſt; quoniam ad id, quòd jam particulas ſuas ſalino-acidas omnes, vel fermè omnes depoſuit, accedit iſtud pretereà, quòd ſyrupo violaceo priùs nonnihil excalefacto, & tincturæ florum maluæ viridem tribuit colorem, ſublimatum corroſivum diſſolutum præcipitat, & cum oleo tartari nullo modo fermentatur. Adde quòd nec vel tantillùm immutat colorem tincturæ heliotropii, quam tamen acida omnia cùm ſolida tum liquida rubefaciunt.

Quodam elapſo Tempore, poſtquam è fixo ſanguinis humani ſale ſpiritum acidum elicuiſſem, viridis recordatus ſum coloris, quem aſſumpſerunt ultimæ guttæ ſpiritus ſubruſi hujuſmodi liquoris, cùm illum à duobus jam elapſis annis ex alembico æneo diſtillarem. Viridis autem,

tem, planèque porraceus color guttarum illarum ſubrufi ſpiritus ſanguinis, meâ quidem ſententiâ, ſuam ducebat originem è quibuſdam vitrioli particulis ſalino-acidis ignea vi ex ære alembici avulſis, & ipſis intimè admiſtis: cum primum recordatio hujuſce coloris animum ſubrepſiſſet; hæc non levem mihi peperit anxietatem; quoniam per hunc caſum, quem veriſſimum etiam atque etiam teſtor, vix dubitare mihi licuit, quin ſanguis à me in vaſe æneo exſiccatus, antequam in fornace figuli torreretur, permultas ex ære-igne avulſas partes vitrioli ſalino-acidas intra textùm ſuum interius admiſiſſet, quæ cum partibus ejus ſalino-acribus ſtrictiſſimo ne dicam indiſſolubili nexu copulatæ ſalſum efformaverant corpus, è quo ſpiritus meus acidus elicitus fuerat.

Cùm hæc apud me, anxius ſanè, aliquandiu meditatus eſſem, & multùm dubitarem an ex ſanguine humano, qui nullo extraneo ſale acido gravidus eſſet, liquor acidus educi poſſet; rei tanti momenti veritatem indagare, & meum, ſi quis eſſet, errorem detegere ſtatui. Quamobrem ſalis fixi è ſanguine humano à me in vaſis figulinis exſiccato eruti unciam unam exactiſſimè miſcui cum unciis tribus boli ſicciſſimi, & tenuiſſimum in pulverem redacti: mixtum hoc in retortam luto, uti ſolet, obductam immiſi; hanc deinceps in chymica mea officina reverberii furno impoſui, & cervici ejus adhibito, aptatoque excipulo, atque juncturis veſicâ ſuillâ madefactâ opertis, & ritè obturatis, igne primùm lento, ac deinceps gradatim, quantùm oportebat, aucto phlegmatis drachmam ſemiſſem cum granis decem extraxi, drachmas verò tres ſpiritus acidi primùm extracto ſpiritui prorſus ſimilis: Hicce ſpiritus dentes plurimùm ſtupeficiens guſtus judicio inter liquores omnes acidos ferè acidiſſimus mihi videtur, & omnes omnino habet dotes, quas ſpiritum acidum primò è ſanguine elicium habere diximus. Feliciſſimus hic meditationum mearum laborumque meorum ſucceſſus qui totam mentem meam blandâ profectò lætitiâ perfudit,

imple-

implevitque, concepta omnia circa extractionem salis acidi è sanguine dubia mihi abstulit penitúsque delevit.

Demum è residua in fundo vasis materia lixivium confeci, ex quo drachmas quinque salis fixi subalbescentis extraxi. Hinc manifestè patet me totum non elicuisse spiritum acidum, quem elicere potuissem è sale fixo, quod una cum bolo in cavitatem retortæ intruseram. Id autem ex animo sic factum est, ne scilicet sal fixum, cujus analysin rursus instituueram, omnibus suis partibus salino-acidis prorsus exveretur. Et verò illud omni suo sale acido exvere nolui exploraturus subinde an quodammodò discreparet à sale fixo, è quo primum spiritum acidum eduxeram, imò & tantùm eduxeram, quantum suppeditare potuerat. Verùm nullum omnino inter bina hæc salia discrimen observare licet. Siquidem ambo levem colorem viridem prorsus similem tribuunt tincturæ florum maluæ; & licet nullam, saltem sensibilem, patiantur fermentationem, cùm spiritus nitri, aut vitrioli, aut quivis alius hujusce generis ipsis affunditur; vehementer tamen & æqualiter fermentescunt, cùm unâ vel alterâ olei vitrioli guttâ irrigantur. Ex his certo certius patet sal fixum sanguinis humani in vase æneo exsiccati, è quo primâ vice spiritum acidum extraxeram, nullis partibus vitrioli salino-acidis gravidum fuisse; propterèaque nequaquam dubitandum est, quin prima Spiritus acidi è sanguine humano extractio undequaque vera extiterit.

Venit vobis fortasse hoc loco in animum, viri clarissimi, sal acre-acidum, & spiritum acidum educta è sanguine non trahi ex hoc liquore virtute ignea, sed ex igne ipso, tanquam è materia, nunc primùm gigni, ac effici: sed experto credite. E sanguine persæpe ipsemet puro calentis solis ardore elicui subrusum sal saporis illo acrioris, qui in sale ignis vi extracto percipitur, quam majorem,

ut

ut ita dicam, acritudinem continuò aciditas linguæ manifesta subsequitur: ac prioris quidem experimenti hæc ratio est, quod sol illius salis acumina parum, ignis verò multum obtundit; posterioris autem hæc, nimirum quòd sal acidum volatile, cujus vi sanguis naturaliter fermentescit arctissimè copulatur cum particulis salino acribus sanguinis ipsius paulatim refrigescentis ubi è vasis suis emissus est: Hi porrò diversi sales mutuò implexi difficilius longè à se invicem separantur calore solis benigno & dulci, quàm violento ignis ardore. Hinc fit, ut sal illud, de quo nunc Sermo habetur, acre-acidum sapiat, & vix cum spiritibus acidis fermentetur, si vitrioli oleum excipiatis.

De variis, quibus sanguis constat, corporibus nihil hîc dicam, viri clarissimi, cum propediem integram hujus liquoris analysin toto triennio elaboratam in lucem daturus sim. Nunc tantùm accipite quâ viâ, quibusve adjumentis consecutus sim tandem justam illam, nec non exactam proportionem quantitatis, quam corporibus illis natura tribuit.

Primùm igitur non unius aut alterius hominis sanguinem, sed multorum, eorumque non sanorum modò, sed ægrorum, non ejusdem, sed diversi ac dissimillimi temperamenti ad exactas analyseos regulas ita examinavi, ut ejusmodi liquoris principia, alia ab aliis, separaverim, & quidem absque ullâ substantiarum jacturâ. Operosum profectò negotium, & molis non parvæ, sed felicitèr tamen meditando, vigilando, sudando tandem confectum. Illud igitùr tantùm videbatur jam esse reliquum ad habendam quantitatem respectivam illorum corporum, ut singula seorsim revocarem ad trutinam; sed profectò plus aliquid requirebatur. Phlegma enim, spiritus subrufus, & oleum fætidum secum partes salinas trahunt, quas neque separare licet, adeòque nec ponderare. Phlegma igitur quoddam excogitavi, & composui omnimodam habens

habens ſimilitudinem cum verò phlegmate ſanguinis, quod deinceps appellabo naturale, quamvis arte chymica extractum, miſcui videlicet pondus dimidii grani ſalis volatilis è ſanguine humano educti cum duodecim unciis aquæ fontanæ diſtillatæ: Ac quamvis duæ illæ moles ita inter ſe eſſent undecim mille quinginta viginti quinque ad unum, tamen aqua tota ſic ſalis tantilli vim ſenſit, ut ſtatim quidem leviſſimum candorem, & exiguiſſimum fætorem quemdam induerit; mixta verò cum ſyrupo violaceo ipſum poſt aliquot horas viridem efficerit, & ſublimatum corroſivum diſſolutum præcipitaverit.

Hinc mihi primùm oborta ingens admiratio naturæ materiam ultrà quàm credi poteſt dividentis; deindè ſpes bona inveniendi quæſitum phlegma. Nec fefellit ſpes; molitus enim multa nequicquam animadverti denique duodecim uncias aquæ fontanæ evadere omnino ſimiles colore, odore, ſapore, & ſubſtantiæ modo phlegmati ſanguinis naturali, ſi ejus, quod dico ſalis granum unum cum quadrante intra illas diſſolvatur. Verùm quo magis illam binorum hujuſmodi phlegmatum ſimilitudinem explorarem; ſumpſi utriuſque moles duas perfectè æquales, quas affudi ſeorſim duabus æqualibus inter ſe molibus tincturæ florum maluæ incluſis ſeorſim duobus vaſculis vitreis æqualis prorſus diaphaneitatis, magnitudinis, & figuræ: tum verò utrique tincturæ viridis color repentè acceſſit, & quidem alter alteri adeò ſimilis, ut nihil omnino eſſet, vel certè deprehendi poſſet, inter utrumque diſcriminis. Ad hæc ſumpſi ejuſdem utriuſque phlegmatis guttas duodecim, quas ſingulas immiſcui ſingulis viginti quatuor guttis ſublimati corroſivi diſſoluti contentis item duobus vaſculis vitreis ejuſdem prorſus diaphaneitatis, magnitudinis, & figuræ, ecce autem eæ ſublimati corroſivi guttæ omnes eodem penitus ad ſenſum candore, lacteo ſcilicet affectæ viſæ ſunt, atque mox in pulverem candidum æqualem æqualiter præcipitatæ.

Patet

Patet igitur luce clarius illa phlegmata ita esse inter se paria, ut nihil magis; quare cùm artificiale phlegma unum tantùm habeat salis volatilis granum cum quadrante, naturale duodecim unciarum tantumdem quoque habet in se, nec plùs, nec minùs.

Quoniam verò arte natura rimanda est, & notis ignota investiganda; per confectum industriâ spiritum quemdam subrufum aggressus ad indagandum salis volatilis quantitatem spiritui subrufo naturali ingenitam; post multa priùs frustrà tentata, repetitaque experimenta tandem animadverti ex viginti septem granis salis volatilis sanguinis in drachma una phlegmatis ejus dissolutis existere liquorem colore, odore, sapore, modoque substantiæ penitus similem subrufo sanguinis ipsius spiritui, qui nihil est aliud, quam phlegma gravidum sale volatili, & propter acuminatas salis ejusdem particulas, & paucum sibi admixtum sulphur, asperum & graveolens, imò & idoneum ad effectus infra memorandos.

Plenam porrò, atque perfectam in omnibus inter illos duos liquores (quorum primum artificialem, alterum verò naturalem spiritum subrufum appello) similitudinem probare volens in singulas duas eorum moles æquales vitreis scyphis contentas injeci quatuor guttas spiritus vitrioli; unde æqualis omnino ex utraque parte secuta est fermentatio: deinde in duos scyphos vitreos diaphaneitate, magnitudine, atque figura pares, quorum uterque viginti guttas tincturæ florum maluæ continebat, utriusque liquoris guttas quinque instillavi; unde statim extiterunt in utraque tinctura pulcherrimi colores duo virides smaragdi instar, & ita similes, ut quantumvis intentos oculos grato errore deciperent. Denique guttas sex uniscujusque spirituum eorumdem in vascula duo infudi, quorum singula quadraginta guttas sublimati corrosivi dissoluti habebant; unde duo emerserunt colores candidi perfectè

fectè ſimiles, peractaque prorſus ſimilis præcipitatio in pulverem coloris candidi aliquantulum rufi.

Ex jam dictis perſpecta penitus, nec non explorata manet omnimoda ſimilitudo inter duos ſpiritus ſubrufos ſupra memoratos; artificialem nempè, atque naturalem: Quamobrem quantùm una drachma artificialis ſpiritus continet in ſe ſalis volatilis ſanguinei (continet autem grana viginti ſeptem) tantùm præciſè quælibet drachma ſpiritus illius naturalis ſinu ſuo complectitur.

Dum perfectam cognitionem quantitatis ſalis, quod oleum fætidum ſanguinis ex alembico vitreo diſtillati ſecum aufert, mihi comparare meditabar, ejuſque indagationem velut opus ingenii mei viribus prorſus impàr, & à me nunquam conficiendum ſpectabam ſciens induſtriâ nullâ componi poſſe oleum fætidum artificiale, quod ſuſcepto meo prodeſſe poſſet, uti phlegma, & ſpiritus ſubrufus arte facta huic antea profuerant; peculiaris fætidi ejuſmodi olei analyſeos inſtituendæ animum ſubiit cogitatio, ut ſalis ejus quantitatem, ſi fieri poſſet, detegerem, quæ ſola mihi detegenda ſupererat, & cujus dignoſcendæ, ut, quod res erat, dicam ardenti flagrabam deſiderio. Voluit, fecitque deus, ut ad vota mea reſponderet eventus.

Peculiarem igitur pauco abhinc tempore olei fætidi ſanguinis analyſin inſtitui; & cuncta certè facta fuere, atque proceſſere, uti mox dicturus ſum: hujuſce olei unciam unam cum unciis tribus boli ficciſſimi, & in pulverem ſubtiliſſimum redacti exactiſſimè miſcui: mixtum illud in globulos exiguos diviſum in parvam retortam luto munitam intruſi; eamque deinceps retortam, cervici ejus convenientis magnitudinis excipulo, ut decebat adhibito, aptatoque, in furno reverberii collocavi, factiſque ritu ſolito reliquis faciendis, igne leniſſimo drachmam ſemiſſem cum granis decem phlegmatis limpidi à bolo ſup-

peditati primum elicui ; mutatoque excipulo, ſtatim atque prima gutta ſpiritus ſubrufi ſeſe mihi in conſpectum dedit, & altero in locum illius ſubſtituto utque par erat concinnato, unciam ſemiſſem cum drachma ſemiſſe & granis duodecim ſpiritus ſubrufi ſpiritui ſubrufo artificiali ſuperiùs memorato prorſus ſimilis igne paulo intenſiori quàm antea eduxi ; poſt modum olei colore, modoque ſubſtantiæ omnimodam ſimilitudinem habentis cum bile intra veſicam felleam naturaliter recondita drachmas duas & ſemiſſem cum granis viginti & uno igne intenſiſſimo erui. Antequam ulterius progrediar hîc obiter notari velim, id diſcriminis eſſe inter ſpiritum ſubrufum & oleum, de quibus nunc agitur, quod ſpiritus, ut pote ſolùm è phlegmate ſaleque conflatus, ignem extinguat, ut patet dum illius guttæ quædam carboni accenſo affunduntur ; oleum verò, quippe quod ſulphureis & ſalinis tantùm partibus conſtat, æque citò ac pulvis pyrius ferè accendatur, totumque in flammam ampliſſimam valdeque nitidam abeat, cum primum igni admovetur.

Demum ex lixivio à me confecto è reſidua in fundo vaſis materia grana octo extraxi ſalis fixi nigricantis, aëris humiditatem facile ſuſcipientis, & linguam vehementer exaſperantis, atque pungentis, quod cum ſpiritibus acidis fermenteſcebat, & tincturam florum maluæ viridem efficiebat. Ex jam dictis facilè atque manifeſtè colligi poteſt unciam illam fætidi olei ſanguinis, cujus analyſin exactiſſimam inſtitui, novemdecim tantum grana terræ continere, quæ cum bolo mixta remanſere.

Et verò cùm inter ſpiritum ſubrufum ex oleo fætido ſanguinis elicitum, & ſpiritum ſubrufum tum artificialem, tum naturalem, de quibus antea ſermonem habui, nec colore, nec odore, nec ſapore, nec ſubſtantiæ modo,

nec

nec effectibus ullis aliquid interfit discriminis, ad firmiter credendum adducor unumquamque spiritus subrufi de quo nunc agitur, drachmam, ut & drachmam quamlibet spiritus subrufi naturalis è sanguine ipso eliciti, grana viginti septem salis continere. Quod attinet ad quantitatem salis impliciti, nexuque indissolubili copulati cum ramosis particulis olei ex oleo fætido liquoris humanæ vitæ fontis educti; hæc facilè, meo quidem judicio, detegi potest; etenim cùm hocce oleum fætore & acrimoniâ prorsus imitetur spiritum subrufum, qui ex eodem, quo ipsemet, oleo fætido sanguinis educitur; ac præterea tincturam florum maluæ eodem planè modo viridem faciat, necessum est, ut unaquæque illius drachma grana viginti septem salis volatilis intra textum suum interius recondat, quæ illud fætore, acrimoniâ, & qualitate illa, quâ tincturæ florum maluæ viridem tribuit colorem, prorsus simile reddant spiritui huic subrufo, qui in distillatione olei fætidi sanguinis ipsi præit.

Habitâ ergo jam, planéque cognita ex superioribus quantitate salis volatilis, quam sive phlegma, sive spiritus subrufus, sive oleum fætidum humani sanguinis secum ferunt, cùm distillantur, nemini prorsus jam potest esse, nondicam ignota, sed ne dubia quidem ullomodo justa illa proportio ponderis, seu quantitatis, quæ à natura inter ea inest corpora, quibus sanguis humanus constat separari enim à se invicem profecto possunt, & quidem sine ullâ imminutione substantiæ: Separavi enim ipse successu planè felici: possunt pariter semel separata ponderari adeòque justa singulorum quantitas ex pondere haberi potest, eâ scilicet cautione adhibitâ, ut pondus salis phlegmate, spiritu subrufo, & oleo fætido è sanguine elicitis contenti ponderi salis volatilis, & fixi ex eodem liquore sub forma corporis solidi

eductorum ſemper adjiciatur ; eà namque ratione verum pondus, adeòque vera proportio quantitatis ſingulorum humani ſanguinis principiorum facilè haberi poterit, ut fuſè planeque explicare conabor in eo, quem ad publicam lucem paro, tractatu integro de ſanguine, cui comitem addam de temperamento hominis tractatum quoque integrum.

Audire vos hoc loco mihi videor, Viri Clariſſimi, quibus, ſi datum eſſet mortali ſcire omnia, nihil eſſet non notum (tanta eſtis mentis acie, tanta ſagacitate ingenii) audire vos inquam mihi videor, ſic fortaſſe objicientes. Sal extractum è ſanguine, ac præſertim volatile fætidum eſt ; retinet igitur in ſe ſulphureas multas particulas, quarum nec pondus, propterea àque nec vera poteſt haberi quantitas ; quamobrem nondum omnia feciſti, aut dixiſti ad demonſtrandam illam, quam jam diu quæris, proportionem quantitatis neceſſaria, ſed quædam ad eam rem valdè pertinentia prætermiſiſti ? iſtud quidem doctè atque appoſitè à vobis mihi objectum fateor. Verum quod in ſale ſanguineo reperitur ſulphuris ita exiguum eſt, ut nullius momenti eſſe videatur. Qua tamen de re plura, eaque, ut ſpero, ad cuilibet ſatisfaciendum idonea, dicam in meo de ſanguine tractatu. Interea ne quid vobis ſubrepat dubii circa ea, quæ ſuperiùs attuli experimenta ; ſic habete me coram teſtibus cùm illuſtribus, tum etiam eruditiſſimis, omnique adeo exceptione majoribus geſſiſſe omnia non ſine aliqua, quod commemorare meum non eſt, omnium laude : Primùm quaſi privatim coram multis medicis peritiâ & probitate inſignibus ; tum coram illuſtriſſimis præſulibus ; Archiepiſcopo nempè Albienſi, & Epiſcopis Tomerienſi, Mirapiſcenſi, Nemauſenſi, Mimatenſi, Vaurenſi, & Aleſienſi, & coram Domino de Baſville Regi à conſiliis ordinariis, & occitaniæ miſſo domi-

dominico de me præclariſſimè merito, Domino de la Loubere, aliiſque non paucis viris ingenio, & nobilitate præſtantibus ; deinde palam, & in publica amphitheatri medici Monſpelienſis luce, in oculis clariſſimorum medicinæ profeſſorum, omniumque ſcholæ medicæ auditorum, aliorumque graviſſimorum, & digniſſimorum ſpectatorum.

In hoc frequenti certè & percelebri conceſſu viſum prætereà eſt pauca referre de inſtituta tribus circiter abhinc annis peractaque accuratè à me bilis analyſi. Quinta enim decima die menſis Februarii, anni 1696. ex ea prodire coegi phlegma quoddam ita limpidum, atque pellucidum, ut inter liquida nullum magis deinde liquorem lacteum inſtar lactis ipſius candidum elicui, tum alia quædam corpora, quæ hîc prætereo ; demum obtutibus omnium circumſtantium illud expoſui Phlegma, & aquam illam lacteam, quæ penes me adhuc eſt integra, & omnis expers corruptelæ, ſed non jam ejuſdem candoris : Magna mihi apud me ipſum de hujuſmodi aqua fuit queſtio, eòque tandem meditando adductus ſum, ut planè crederem chylum ex bile in tenuibus inteſtinis diffuſâ volatile haurire Sulphur onuſtum ſale acri ſimiliter volatili partibus ſuis ſalino-acidis ferè exuto, adeòque admodùm leni ; nec dubitavi aſſerere ſulphure illo ſale acri-acido leniſſimo gravido, ac velut condito chylum albeſcere, diſponi ad fermenteſcendum in cavitatibus cordis, & ad formam ſanguinis facilius accipiendam præparari. Unde conſequens eſt bilem ab hepate ad inteſtinum duodenum choledochi meatus interventu naturaliter amandatam novum ſingulis diebus, extra omne dubium, ſuppeditare fermentum maſtæ ſanguineæ, quod nativis illius fermentis (dummodò ipſa naturalis ab indole ſua non deſciverit) vigorem inſpirat, & eorum jacturas reparat ; atque adeò fer-

fermentationis naturalis ejuſdem liquoris perennitati mirum in modum confert. Quam mentem meam, ſi non penitus certam, admodùm certè probabilem ſequenti experimento confirmavi. In drachmam unam bilis tepidæ recens è veſica fellis vervecis extractæ, & intra collum infundibuli vitrei contentæ uncias octo aquæ fontanæ imbutas exiguo vitrioli ſpiritu injeci ; ſtatimque aqua illa albedinem aſſumpſit fere lacteam, majorem aſſumptura, ſi quatuor ſalis abſynthii grana ipſi admiſcuiſſem. Poſtquam verò experiendi finem feci monui quod priùs compereram, nimirum phlegma quoddam elicitum ex pane, quod ſecum auſert in diſtillatione ſal acidum volatile, ſi, qua par eſt, copiâ in bilem projiciatur, lacteam quamdam ſoliditatem, lacteamque colorem accerſere.

Illud phlegma tincturam heliotropii, & florum maluæ rubefacit ; ſed, quod majus eſt, ruſus panis ejuſdem ſpiritus cum ſale tum fixo, tum volatili ſanguinis diutiùs fermenteſcit ; quàm quivis alius fluor acidus. Unde maximum, ne dicam inexpugnabile deſumitur argumentum dicendi magnam expane, quo potiſſimùm veſcitur homo, ſalis acidi copiam educi, ut fuſe alibi explicabitur, quod una cum acido nitro aëreo jam jam memorati liquoris fermentationi excitandæ, atque ſuſtinendæ plurimùm conducit.

Quid cogitem ego, quid ſentiam de morbis profectis a bile malè temperata defluente in primum gracile inteſtinum, neque hîc eſt dicendi locus, neque, ſi eſſet, dicerem tamen. Sentio enim tandem, Viri Clariſſimi, certè ſeriùs quàm decebat, me illectum, atque abreptum ſumma colloquendi vobiſcum jucunditate veniſſe ſenſim in oblivionem officii, & illud ipſum faſtidium veſtrum, quod initio ſcribendi cavere imprimis decreveram, poſt modùm tamen longiori epiſtolâ incurriſſe.

Accedit

Accedit quòd majorem partem vendicare mihi non ſum veritus temporis illius, quod vobis, & ſaluti publicæ debetis, ac redditis. Facti pœnitet. Vos pro ea, qua nati eſtis, tum humanitate, tum honeſtate ſumma, ignoſcite mihi ſervo veſtro humillimo, & facite quæſo, ut veſtrum omnium ad me veniat judicium; de cunctis in medium hactenus à me allatis, quæ diligenti veſtro examini (qui meus eſt honos) lubens ſubjicio: ſi veſtro mihi videantur digna calculo, hæc, pro magno quo apud me numero eſtis, velut principia nunquam diruenda, atque adeò ipſiſmet temporibus futuris ſemper coæva futura ſpectabo: ſin è contra id conſequantur infortunii, ut nobis non probentur, quin potiùs nauſeam pariant ea, ut potè publicâ lucis uſurâ prorſus indigna, lethæi fluminis undis ſubmergi velim. Valete.

Monſpelii, die ſexta menſis Junii, anni 1698.

IV. *Account*

IV. *Account of a Book.* La Meridiana del Tempio de S. Petronio, *&c. i. e. The Meridian Line of the Church of St.* Petronio *drawn and fitted for Aſtronomical Obſervations in the Year* 1655. *reviſed and reſtored in the Year* 1695. *by Signior* John Dominico Caſſini, *Primary Aſtronomer of the School of* Bononia, *Pontificial Mathematician, of the Royal Academy of Sciences, and R. S. Printed at* Bononia 1695. *in Twenty Two Sheets in Fol.*

IN this Book (written in part by Signior *Caſſini*, whilſt in *Italy*, but augmented and publiſhed by Signior *Dominico Guglielmini* after his departure thence) there is an Account given of the Occaſion of the making of this Meridian Line by *S. Caſſini*, in the Year 1655. of the Method of doing it, and of the Exactneſs with which it was performed at that time by him: Then of the Uſes that have been made of it, and of the Alterations that have happened to this Church ſince that time, and of the Reſtauration and Verification of it in the Year 1695. by the ſaid Signior *Caſſini* himſelf; and laſtly, of the Uſes that may be made of it for the future.

To this Diſcourſe, which was written by Signior *Caſſini* himſelf, is adjoined a Diſcourſe of Signior *Dominico Guglielmini*, Mathematician and Publick Lecturer of *Bononia*, giving an Account of the Operations made, and of the Inſtruments imployed in this laſt Reſtauration of the ſaid Meridian Line.

In

In the first Section *S. Cassini* says, this Verification was the more considerable, *First*, because it fell out to be made the Year before the last Intercalation of the Gregorian Account (which was first established in the Year 1582. Since which time no Intercalation has been omitted, but the first is to be omitted in the Year 1700. to reduce the Anticipation of the Equinoctials since that time, and so to make the Day of the Vernal Equinox to be the 21th of *March*) By which opportune Occurrence, this Line would afford a proper means to observe exactly the time of the Sun's Ingress into *Aries*, or of its passing the Equinoctial Circle. *Secondly*, Because it would be a means for determining a Controversy now much agitated among learned Men; to wit, Whether the Positions of the Meridians and Parallels of Places on the Surface of the Earth, do really alter or not. For that not only the present Postures of them are found very differing from those assigned them by the ancient Geographers: But considerable Differences are also found out amongst the more modern Observations, as in the present Meridian of *Uranibarg*, which has lately been found by Monsieur *Picart*, *Erasmus Bartholinus*, and others, to vary 18 Minutes towards the East, from that fixed by the Noble *Tycho Brahe*, about 100 Years since. And the great Pyramid of *Egypt* has been very lately found to stand in a Posture that Two of its sides do respect the South. Now Signior *Cassini* having found by this last Rectification of his Meridian Line, that both the Meridian and Parallel of *Bononia*, have not been altered or changed now after 40 Years space, conceives that there has not ever been any such Alteration as is supposed, but that those Differences that have been found at distant times, have been occasioned by the Defects or Mistakes of the Observations themselves: Whence he conceives that the accurate Astronomer, *Tycho*, was mistaken in the

Position of the Meridian of *Uraniburg*. And as to the present Position of the Pyramid, he supposes it was at first so placed. But because, notwithstanding his Observations, he found that many were of a contrary Sentiment, and that it had partly been occasioned by a Meridian formerly fix'd in this Church, he in the next Section gives an Account of that old Meridian Line: and the occasion of the first making of this (he says) was for the rectifying the time of *Easter*, and the Feasts of the Church which depend upon the true time of the *Vernal Equinox*. For the Prelates of *Alexandria* (who when deputed by the Council of *Nice* to state that time) found it then to be on the 21th of *March*. But Pope *Gregory* being informed that in his time it fell on the 11th of that Month, he altered the Julian Account, and made the 11th to be the 21th of the same Month. This was the occasion that *Ignatio Dante* (Publick Lecturer of Mathematicks at *Bononia*) first made a Meridian Line in the Pavement of the Church of St. *Petronio*, in the Year 1575. Seven Years before the Alteration made of the *Julian* Account, and the establishment of the *Gregorian*, in the Year 1582. But this Line of *Dante*'s having been found to vary from the true Meridian of the Place, and so to be serviceable only for the observing of the Solstices (it varying 8 or 9 Degrees from the North towards the East) and it being supposed to be so misplaced at first by reason of the Obstruction of the Pillars of that Church, was the occasion of Signior *Cassini*'s finding a fitter Place in the same Church, and of fixing there his new Meridian Line, in the Year, 1655. the Place where, and the manner how, he has more particularly and fully expressed in this Discourse. And because it was of so considerable, and as it were, of Sacred use to the Church (the Feasts thereof depending on the Rectification of the time made by it) he names all the eminent Astronomers, who were his Concomitants and Assistants in the Operations, as Witnesses of the Exactness of them. After this (he relates several Variations that have happened to the Fabrick, since he first fixed this his Meridian Line, and thereby shews the Necessity and Use of the Restauration and adjusting of it for the time to come, by which any farther Alteration that may happen to that Building, or otherwise for the Future, may be so far discovered and remedied, and the essential parts of this Line so far restored and rectified, that they shall be as effectual, as if no Alteration had happened.

ed. The Uſes of which will be not only to ſhow the true time of the Sun's ingreſs into the Tropick and Equinoctial Points, but likewiſe into all the other Eight Signs; and ſo will ſerve for the verifying and rectifying of the Calendar, the ſame being now ſo placed, as that the Perpendicular height of the Hole, by which the Light is admitted (which is an Inch in Diameter) is 1000 Inches of the Pariſian Foot above the Pavement, and the Meridian Line, which is as a Tangent to it, has the Tangent of 45 Degrees actually divided into 100000 Parts upon one of the Marble Cheeks that border the Ruler or Lath of Iron that expreſſes the Meridian Line in the Floor of the Church, and upon the other Cheek of Marble are marked the Degrees, *&c.* of the Diſtance of the Sun from the Zenith, whereon are alſo marked the Places of the Signs of the Ecliptick. From the Obſervations made by this Line, Sig. *Caſſini* calculated his Tables of Refractions, which have been ſince verifyed by many other Obſervations, both of himſelf and others.

Theſe Conſiderations induced the Sentors of *Bononia* (who had the Care of the Edifice of St. *Petronio* committed to them) to be at the Charge of repairing the ſaid Meridian Line, and to take care that it ſhould be preſerved for the future. For which intent they not only cauſed the Inſtruments made uſe of in the fixing this Line to be ſafely preſerved, but they alſo deſired Signior *Guglielmini* to make ſo perfect a Deſcription of them, that in caſe of their Decay, it might be known how to ſupply and make uſe of them for this Purpoſe for the future. Which intention and Deſire the ſaid learned Profeſſor has fully proſecuted and compleated in his Diſcourſe ſubjoined to that of Signior *Caſſini*, and he hath alſo added ſome uſeful Tables, as that of the parts of the Radius, anſwering to the Diviſions of the Tangent into Degrees, Minutes, *&c.* *Secondly*, Thoſe of the Refractions and Parallaxes of the Sun at ſeveral Altitudes. *Thirdly*, A Table of Declination of every Point of the Ecliptick, anſwering to the Minutes of Declination for the preſent Obliquity of the Ecliptick, which he makes to be 23°. 29'. 12". He adds alſo, That he himſelf by acurate Obſervations, finds the height of the Pole at that Church to be 44°. 30'. 15". which is 1'. 15". greater than what S. *Caſſini* had found it in the Year 1655. All which Particulars, and divers other very remarkable, may be found in the Book it ſelf, to which therefore I refer the Reader. V. *A*.

V. *A Catalogue of Books lately printed, not mentioned in these Transactions.*

INscriptiones Græcæ Palmyrenorum cum Scholis & Annotationibus Edwardi Bernardi, & Thomæ Smithi, Traject. ad Rhen, 1698. 8vo.

Joh. Perri Erici Ἀνθρωπογλωττολογια, sive humanæ linguæ geneſis partis 1. tomus 1. Venet. 1697. in 4to.

L'Anatomie du corps humain, & inſtitution de medecine contenant ce qu'il faut faire pour conſerver ou pour recouvrer la ſante Par. 2. Vol. in 12mo. par le prieur de Saint Hilaire.

Portrait hiſtorique de l'Empereur de la Chine, preſente au roy par le P. Jean. Bouvet de la Compagnie de Jeſus Miſſionaire de la Chine. ib. 1697. in 12mo.

Lettre de M. Barthelemi Linand. M. D. ecrite le 15. Oct. 1696. ou il repond a quelques objections qu'on a faites contre ſon livre des eaux minerales de Forges. ib. 1698. in 8vo.

Journal du voyage des grandes Indes, contenaut tout ce qui s'y eſt fait & paſſe par l'eſcadre de ſa Majeſte envoyè ſous le ccommandement de M. de la Haye. Orleans, 1697. in 12mo.

VI. *Extracts out of ſome late Accounts and Letters.*

MOnſieur *Lemery* has printed at *Paris* a Book called, *Hiſtoire univerſelle des drogues.*

Moreri's Dictionary is reprinting at *Paris* in Four Volumes in *Fol.* and will be finiſhed in Five or Six Months.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

PHILOSOPHICAL TRANSACTIONS.

For the Month of July, 1698.

The CONTENTS.

I. *An Observation of Two Boys bit by a Mad Dog; Communicated by Dr.* Martin Lister, *Fell. of the Coll. of Phys. and R. S.* II. *A Letter of Dr.* John Wallis *to* Samuel Pepys *Esq; relating to some supposed* Imperfections *in an* Organ. III. *A Letter from Dr.* William Musgrave, *Fellow of the Coll. of Phys and R. S. to Dr.* Sloane, *concerning a Periodical Palsy.* IV. *Of the Posture-Master.* V. *An Account of some Effects of* Papaver Corniculatum luteum, &c. *By Mr.* Ja. Newton. VI. *Part of a Letter from Sir* Robert Sibbald, *to Dr.* Sloane, *concerning several Stones voided by a Boy,* &c. VII. *Part of a Letter written by* Roelof Diodati, *Supream Director of the Council of* Mauricius; *to Mr.* Witsen, *Burger-Master of* Amsterdam, *and* F. R. S. *dated the 8th of* August, 1697. *concerning an extraordinary Inundation in that Island.*

I. *An Observation of Two Boys bit by a Mad Dog, Communicated by Dr.* Martin Lister, *Fellow of the Coll. of Phys. and R. S.*

ABout the last of *October*, 1679. it happened that Two Boys of Ten and Nine Years Old, of a Sanguin and Cholerick Complexion, did touch and handle the Head of a Dog which had been wounded by a Mad Dog, which by the handling and washing of his Wound by the Children, the Dog so wounded was healed, and did not become Mad.

But about *May*, 1680. the Children became so unwell, and were seized with a paining Grief towards the bottom of their Bellies, which did grind and torment them with Pain and Trouble, which ascended gradually upwards towards their Navil.

And about the First of *July*, together with the foresaid Grief, they were taken with a slow Flux, and with Fainting Fits by times, when the fore-said Pains assaulted them. After they had continued thus for a time, their Pain and Grief ascended towards and above the Stomach, whereupon followed very violent and Convulsive-like Motions in their Bodies, especially about the Stomach and Belly, by which they were tossed and tumbled and disturbed in the whole Body, with some foaming at the Mouth, in the interim of their Fits; now and then these Symptoms continued and increased until the latter end of *August* that they were taken with the Fear of Water, and could not indure to look into any

Liquid

Liquid thing, until the Cup was covered, but forthwith would have fallen down as dead, and ſo would have layn a little time as in a ſounding or dead Fit; and then would have tumbled and toſſed in the fore-ſaid violent Motions and Diſtractions of their Bodies, moaning and groaning; and ordinarily, the Eldeſt eſpecially, ſnarled, barked, and endeavoured to bite like a Dog, they continued in this Fit for an Hour ſometimes, and ſometimes leſs, and ſo came out of the Convulſive-like Motions, lying as it had been in a Sound, a little before they came out of the Fits, and when they did come out of the Fits, would have cropen away in a feared manner from any who had been by them: and thus within an Hour, or little more, they came ſo out of their Fits, that they were alſo well and as much themſelves as ever.

Obſerve that they both took the Fits and came out of them at the ſame time; as ſoon as the Eldeſt fell in, immediately the Youngeſt took the Fit, and when the Eldeſt began to come out of the Paroxiſm or Fit, the Youngeſt became forthwith well. And thus they remained under the ſaid Symptomes until the middle of *September*, every Day taking the ſaid Fits, in which they could not ſpeak, and in their Intermiſſions were as towardly and in their Wits as ever.

But about the middle of *September*, about which time, eſpecially their Barking and ſnarling like a Dog came, they became more wild; ſo as for ſome Days now and then, even whilſt out of their torturing Fits, they would not endure any Company, no not ſo much as to come near one the other, but would have fled from all others, ſo from one another, and thus continued of this Diſpoſition for a Week; and then the Eldeſt drew near his Father, ſaying as one ſurpriz'd, *Father, I am well*; and ſo he

he and the other became forthwith well, that they would not only converſe with Friends and others, but alſo look into the Water without any fear; and as well in their Wits and Memories as ever, and ſo continued to be well for Three or Four Days, and after that fell ill again, and remained ill Six or Seven Days, at the end whereof they became well, in ſaying as formerly on a ſuddain to their Father, *Father, I am well*; and thus became well about the end of *September*, and continued both well as ever they were, to the Apprehenſion of all On-lookers, until the end of *January*, that the Eldeſt had ſome Fits like the former; but the Youngeſt remained well ever ſince *September*.

Obſerve, that ſometimes in *Auguſt*, when the Symptomes did ſo appear as the Learned took up the Diſtemper to flow from the Poiſon of a Mad Dog, there were Doſes of Antimony and *Mercurius Vitæ* preſcribed which accordingly was adminiſtred, together with Antidotes of Venice Treacle, Powder of Crabs Eyes, and other things.

A Letter of Dr. John Wallis *to* Samuel Pepys *Esquire, relating to some supposed* Imperfections *in an* Organ.

Mr. *Harris* an Organ-maker (whom I find, by the little discourse I had with him, to be very well skilled in his profession) was lately with me, as by direction from you, to ask my opinion about perfecting an Organ, in a point wherein he thinks it yet Imperfect.

'Tis an honour you please to put upon me, to think my opinion considerable in a thing wherein I am so little acquainted as that of an Organ.

I do not pretend to be perfectly acquainted with the Structure of an Organ, its several Parts, and the Incidens thereunto; Having never had Occasion and Opportunity to inform my self particularly therein. And, for the same reason, many of the Words, Phrases, Forms of Speech, and Terms of Art, which are familiar to Organists and Organ-makers, are not so to me. Which therefore I shall wave; (For till we perfectly understand one anothers Language, it is not easy to speak intelligibly;) and apply my self directly to what is particularly proposed.

This (I take it) is evident; That each *Pipe* in the Organ is intended to express a distinct *Sound* at such a *Pitch*; That is, in such a determinate Degree of *Gravity* or *Acuteness*; or (as it is now called) *Flatness* or *Sharpness*. And the *Relative* or *Comparative* Consideration of Two (or more) such Sounds or Degrees of Flatness and Sharpness, is the ground of (what we call) *Concord* and *Discord*; that is, a Soft, or Harsh, coincidence.

Now, concerning this, there were amongst the Ancient Greeks, Two (the most considerable) *Sects* of Musicians: the *Aristoxenians*, and the *Pythagorians*.

They both agreed thus far; That *Dia-tessaron* and *Dia-pente*,

do together make-up *Dia-paſon*; that is (as we now ſpeak) a *Fourth* and *Fifth* do together make an *Eighth* or *Octave*: And, the *Difference* of thoſe two (of a Fourth and Fifth) they agreed to call a *Tone*; which we now call a *Whole note*.

Such is that, (in our preſent Muſick,) of *La Mi*, (or as it was wont to be called, *Re Mi*.) For *La fa ſol la*, or *Mi fa ſol la*, is a perfect *Fourth*: And *La fa ſol la mi*, or *La mi fa ſol la*, is a perfect *Fifth*: The *Difference* of which, is *La mi*. Which is, what the Greeks call, the *Diazeuctick Tone*; which doth *Dis-join* two *Fourths* (on each ſide of it;) and, being added to either of them, doth make a *Fifth*. Which was, in their Muſick, that from *Meſe* to *Parameſe*; that is in our Muſick, from A to B: ſuppoſing *Mi* to ſtand in B *fa* b *mi*, which is accounted its *Natural* poſition.

Now, in order to this, *Ariſtoxenus* and his Followers, did take, that of a *Fourth*, as a *Known Interval*, by the judgement of the Ear; and, that of a *Fifth*, likewiſe; And conſequently, that of an *Octave*, as the *Aggregate* of both; and that of a *Tone*, as the *Difference* of thoſe Two.

And this of a *Tone* (as a *known Interval*) they took as a *common Meaſure*, by which they did eſtimate other Intervals. And accordingly they accounted a *Fourth* to contain *Two Tones and an half*; a *Fifth* to contain *Three Tones and an half*; and conſequently an *Eighth* to contain *Six Tones*, or *Five Tones and two Half-tones*. And it is very near the matter, though not exexactly ſo.

And at this rate we commonly ſpeak at this day; ſuppoſing an *Octave* to conſiſt of *Twelve Hemitones*, or Half-notes. (Meaning thereby, ſomewhat near ſo many half-notes:) But, when we would ſpeak more Nicely, we do not take thoſe ſuppoſed *Half-notes* to be exactly *Equal*, or each of them juſt the *Half* of a *Full-note*, ſuch as is that of *La-mi*.

Pythagoras and thoſe who follow him, not taking the Ear alone to be a competent Judge in a caſe ſo nice; choſe to diſtinguiſh theſe, not by *Intervals*, but by *Proportions*. And accordingly they accounted that of an *Octave*, to be, when the degree of Gravity or Acuteneſs of the one Sound to that of the other, is *Double*, or as 2 to 1; that of a *Fifth*, when it is *Seſqui-alter*, or as 3 to 2; that of a *Fourth* when *Seſqui-tertian*, or as 4 to 3. Accounting That, the Sweeteſt proportion, which is expreſſed in the Smalleſt Numbers; and therefore (next to the *Uniſone*) that

of

of an *Octave*, 2 to 1; then that of *a Fifth*, 3 to 2; and then that of a *Fourth*, 4 to 3.

And thus, that of a *Fourth* and *Fifth*, do together make an *Eighth*; For $\frac{4}{3} \times \frac{3}{2} = \frac{4}{2} = \frac{2}{1} = 2$. That is, *four thirds* of *three halves*, is the ſame as *four halves*, that is *Two*. Or (in other words to the ſame ſenſe) the proportion of 4 to 3, compounded with that of 3 to 2, is the ſame with that of 4 to 2, or 2 to 1. And, conſequently, the *Difference* of thoſe Two, which is that of a *Tone* or *Full-Note*, is that of 9 to 8. For $\frac{4}{3})\frac{3}{2}(\frac{9}{8}$; that is, *three halves* divided by *four thirds*, is *nine eights*; or, if out of the proportion of 3 to 2, we take that of 4 to 3; the Reſult is that of 9 to 8.

Now, according to this Computation, it is manifeſt, That an *Octave* is ſomewhat leſs than *Six Full-notes*. For (as was firſt demonſtrated by *Euclide*, and ſince by others) the Proportion of 9 to 8, being ſix times compounded, is ſomewhat more than that of 2 to 1. For $\frac{9}{8} \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8} \times \frac{9}{8} = \frac{531441}{262144}$, is more than $\frac{524288}{262144} = \frac{2}{1}$.

This being the Caſe; they allowed (indiſputably) to that of the *Dia-zeuctick Tone* (*La mi*,) the full proportion of 9 to 8; as a thing not to be altered; being the Difference of *Dia-pente* and *Dia-teſſaron*, or the *Fifth* and *Fourth*.

All the Difficulty, was, How the remaining *Fourth* (*Mi fa ſol la*) ſhould de divided into three parts, ſo as to anſwer (pretty near) the Ariſtoxenians *Two Tones and an Half*; and might, altogether, make up the proportion of 4 to 3; which is that of a *Fourth* or *Dia-teſſaron*.

Many attempts were made to this purpoſe: And, according to thoſe, they gave Names to the different *Genera* or Kinds of Muſick, (the *Diatonick*, *Chromatick*, and *Enarmonick* Kinds,) with the ſeveral *Species*, or leſſer Diſtinctions under thoſe Generals. All which to enumerate, would be too large, and not neceſſary to our buſineſs.

The firſt was that of *Euclide* (which did moſt generally obtain for many ages:) Which allows to *Fa ſol*, and to *Sol la*, the full proportion of 9 to 8; And therefore to *Fa ſol la* (which we call the *greater Third*,) that of 81 to 64. (For $\frac{9}{8} \times \frac{9}{8} = \frac{81}{64}$.) And, conſequently, to that of *Mi fa* (which is the Remainder to a *Fourth*) that of 256 to 243. For $\frac{81}{64})\frac{3}{4}(\frac{256}{243}$; that is, if out of the proportion of 4 to 3, we take that of 81 to 64, the Reſult is that of 256 to 243. To this they gave the name of *Limma* (λεῖμμα)

that is, the *Remainder* (to wit, over and above *Two Tones.*) But, in common diſcourſe (when we do not pretend to ſpeak nicely, nor intend to be ſo underſtood) it is uſual to call it an *Hemitone* or *Half-Note* (as being very near it) and, the other, two *Whole-Notes.* And this is what *Ptolemy* calls *Diatonum Ditonum,* (of the *Diatonick* kind with *Two full Tones.*)

Againſt this, it is objected (as not the moſt convenient Diviſion,) that the Numbers of 81 to 64, are too great for that of a *Ditone* or *Greater Third*: Which is not *Harſh* to the Ear; but is rather *Sweeter* than that of a ſingle *Tone,* who's proportion is 9 to 8. And in that of 256 to 243, the Numbers are yet much greater. Whereas there are many proportions (as $\frac{5}{4}, \frac{6}{5}, \frac{7}{6}, \frac{8}{7}$,) in ſmaller numbers than that of 9 to 8; of which, in this diviſion, there is no notice taken.

To rectify this, there is another Diviſion thought more convenient; which is *Ptolemy's Diatonum Intenſum* (of the *Diatonick* Kind, more *Intenſe* or Acute than that other..) Which, inſtead of Two *Full tones* for *Fa ſol la*; aſſignes (what we now call) a *Greater* and a *Leſſer* Tone; (which, by the more nice Muſicians of this and the laſt Age, ſeems to be more embraced;) Aſſigning to *Fa ſol*, that of 9 to 8 (which they call the *Greater Tone*:) and to *Sol la*, that of 10 to 9, (which they call the *Leſſer Tone*:) And therefore to *Fa la* (the *Ditone* or *Greater Third*) that of 5 to 4. (For $\frac{10}{9} \times \frac{9}{8} = \frac{10}{8} = \frac{5}{4}$.) And conſequently, to *Mi fa* (which is remaining of the *Fourth*) that of 16 to 15. For $\frac{5}{4}) \frac{4}{3} (\frac{16}{15}$. That is; if out of that of 4 to 3, we take that of 5 to 4, there remains that of 16 to 15.

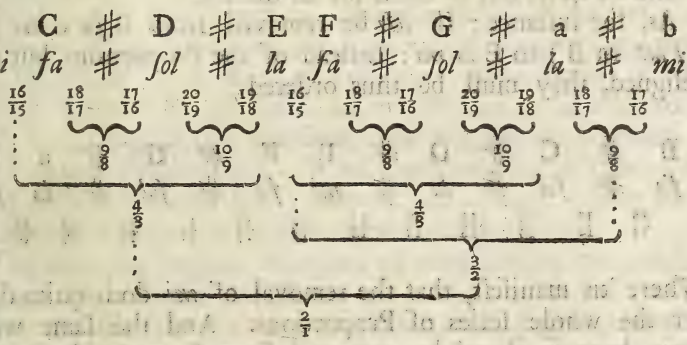
Many other waies there are (with which I ſhall not trouble you at preſent) of dividing the *Fourth* or *Dia-teſſaron*, or the proportion of 4 to 3, into three parts, anſwering to what (in a looſer way of Expreſſion) we call an *Half-note*, and two *Whole-notes.* But this of $\frac{16}{15} \times \frac{9}{8} \times \frac{10}{9} = \frac{4}{3}$, is that which is now received as the moſt proper. To which therefore I ſhall apply my diſcourſe. Where $\frac{16}{15}$ is (what we call)the *Hemitone* or *Half-note*,in *Mi fa*; $\frac{9}{8}$ that of the *Greater-Tone*,in *Fa ſol*;and $\frac{10}{9}$ the *Leſſer-Tone*,in *Sol la.*

Onely with this addition; That each of thoſe Tones, is (upon occaſion) by *Flats* and *Sharps* (as we now ſpeak) divided into two *Hemitones* or *Half-notes*: Which anſwers to what by the Greeks was called *Mutatio quoad Modos* (the change of Mood;) and what is now done by removing *Mi* to another Key. Namely $\frac{9}{8} = \frac{18}{16} = \frac{18}{17} \times \frac{17}{16}$; and $\frac{10}{9} = \frac{20}{18} = \frac{20}{19} \times \frac{19}{18}$.

Thus,

Thus, by the help of *Flats* and *Sharps* (dividing each *Whole-note*, be it the Greater or the Leſſer, into two *Half-notes*, or what we call ſo,) the whole *Octave* is divided into Twelve Parts or Intervals (contained between Thirteen Pipes) which are commonly called *Hemitones* or *Half-notes*. Not, that each is preciſely *Half a Note*, but ſomewhat near it, and ſo called. And I ſay, by *Flats and Sharps*; For ſometime the one, ſometime the other, is uſed. As, for inſtance, a *Flat* in D, or a *Sharp* in C, do either of them denote a *Midling* Sound (tho' not preciſely in the Midſt) between C and D; Sharper than C, and Flatter than D

Accordingly; ſuppoſing *Mi* to ſtand in B *fa* b *mi* (which is accounted its Natural ſeat) the Sounds of each Pipe are to bear theſe proportions to each other, viz.



And ſo in each Octave ſucceſſively following. And if the Pipes in each Octave be fitted to ſounds in theſe proportions of Gravity & Acuteneſs; it will be ſuppoſed (according to this Hypotheſis) to be perfectly proportioned.

But, inſtead of theſe ſucceſſive proportions for each Hemitone; it is found neceſſary (if I do not miſtake the practiſe) ſo to order the 13 Pipes (containing 12 Intervals which they call Hemitones) as that their Sounds (as to Gravity & Acuteneſs) be in Continual Proportion, (each to its next following, in one and the ſame Proportion;) which, all together, ſhall compleat that of an Octave or Dia-paſon, as 2 to 1. Whereby it comes to paſs, that each Pipe doth not expreſs its proper Sound, but very near it, yet ſomewhat varying from it; Which they call *Bearing*. Which is ſomewhat of Imperfection in this Noble Inſtrument, the Top of all.

It

It may be asked, Why may not the Pipes be ſo ordered, as to have their Sounds in juſt Proportion, as well as thus *Bearing*?

I anſwer, It might very well be ſo, if all Muſick were Compoſed to the ſame *Key*, or (as the Greeks call it) the ſame *Mode*. As, for inſtance, if, in all Compoſitions, *Mi* were alwaies placed in B *fa* b *mi*. For then the Pipes might be ordered in ſuch proportions as I have now deſigned.

But Muſical Compoſitions are made in great variety of *Modes*, or with great diverſity in the *Pitch*. *Mi* is not always placed in B *fa* b *mi*; but ſometimes in E *la mi*; ſometimes in A *la mi re*, &c. And (in ſumme) there is none of theſe 12 or 13 Pipes but may be made the Seat of *Mi*. And if they were exactly fitted to any one of theſe caſes, they would be quite out of order for all the reſt.

As, for inſtance; If *Mi* be removed from B *fa* b *mi* (by a *Flat* in B) to E *la mi*: Inſtead of the Proportions but now deſigned, they muſt be thus ordered;

B	♯	C	♯	D	♯	E	F	♯	G	♯	a	b
fa	♯	*ſol*	♯	*la*	♯	*mi*	*fa*	♯	*ſol*	♯	*la*	*fa*
$\frac{18}{17}$	$\frac{17}{16}$	$\frac{20}{19}$	$\frac{19}{18}$	$\frac{18}{17}$	$\frac{17}{16}$	$\frac{16}{15}$	$\frac{18}{17}$	$\frac{17}{16}$	$\frac{20}{19}$	$\frac{19}{18}$	$\frac{16}{15}$	

Where 'tis manifeſt, that the removal of *mi* doth quite diſorder the whole ſeries of Proportions. And the ſame would again happen, if *mi* be removed from E to A (by another *Flat* in E.) And again if removed from A to D. And ſo perpetually.

But the Hemitones being made all Equal; they do indifferently anſwer all the poſitions of *Mi* (though not exactly to any:) Yet nearer to ſome than to others. Whence it is, that the ſame Tune ſounds better at one Key than at another.

It is asked, Whether this may not be remedied; by interpoſing more Pipes; and thereby dividing a Note, not only (as now) into *Half-notes*, but into *Quarter-notes* or *Half-quarter-notes*, &c.

I anſwer; It may be thus remedied in part; (that is, the Imperfection might thus be ſomewhat Leſs, and the Sounds ſomewhat nearer to the juſt Proportions:) but it can never be exactly true, ſo long as their Sounds (be they never ſo

many) be in continual proportion; that is, each to the next ſubſequent in the ſame Proportion.

For it hath been long ſince Demonſtrated, that there is no ſuch thing as a *juſt Hemitone* practicable in Muſick, (and the like for the diviſion of a Tone into any number of *Equal* parts; three, four, or more.) For, ſuppoſing the Proportion of a *Tone* or *Full-note*, to be $\frac{8}{9}$ (or, as 9 to 8;) that of the *Half-note* muſt be as $\sqrt{9}$ to $\sqrt{8}$ (as the *Square-root* of 9 to the *Square-root* of 8; that is, as 3 to $\sqrt{8}$, or 3 to $2\sqrt{2}$,) which are *Incommenſurable* quantities. And that of a *Quarter-note*, as $\sqrt{qq}\,9$ to $\sqrt{qq}\,8$, (as the *Biquadrate* root of 9, to the *Biquadrate* root of 8,) which is yet more *Incommenſurate*. And the like for any other number of Equal parts. Which will therefore never fall-in with the Proportions of Number to Number.

So that this can never be perfectly adjuſted for all Keys (without ſomewhat of Bearing) by multiplying of Pipes; unleſs we would for every Key (or every different Seat of *Mi*) have a different Set of Pipes, of which this or that is to be uſed, according as (in the Compoſition) *Mi* is ſuppoſed to ſtand in this or that Seat. Which vaſt number of Pipes (for every Octave) would vaſtly increaſe the Charge. And (when all is done) make the whole impracticable.

Theſe are my preſent thoughts, of the Queſtion propoſed to me, and upon theſe grounds.

You will pleaſe to excuſe me for the trouble I give you of ſo long a Letter.

I thought it neceſſary, to give a little intimation of the Ancient Greek Muſick compared with what is now in practiſe; which is more the ſame than moſt men are aware of: though the Language be very different. But I was not to be large in it. Thoſe who deſire to know more of it; may ſee my thoughts more at large, in that Appendix which I have added at the end of my Edition of Ptolemy's Harmonicks in Greek and Latin.

The two Eminent Sects amongſt them, the *Ariſtoxenian* and the *Pythagorian*, differ much at the ſame rate as doth the Language of our ordinary practical Muſicians, and that of thoſe who treat of it in a more Speculative way.

Our Practical Muſicians talk of *Notes* and *Half-notes*, juſt as the *Ariſtoxenians* did; as if the *Whole Notes* were all Equal; and the *Half-notes* likewiſe each the juſt Half of a Whole Note.

And

And thus it is neceſſary to ſuppoſe in the Pipes of an Organ; which have each their determinate Sound and not to be corrected, in their little Inequalities, as the Voice may be by the guidance of the Ear.

But *Pythagoras*, and thoſe who follow him found (by the Ear) that this Equality of Intervals would not exactly anſwer the Muſical Appearances, in Concords and Diſcords: juſt as our Organiſts and Organ-makers be now aware; that their Pipes at equal Intervals do not give the juſt deſired Harmony, without ſomewhat of *Bearing*, that is, of ſome little variation from the juſt Sound.

The *Pythagorians*, to help this, changed the notion of *Equal Intervals* into that of *due Proportions*. And this is followed by *Zarline*, *Keppler*, *Cartes*, and others who treat of Speculative Muſick in this and the laſt Age. And though they ſpeak of Notes and Half-notes (in a more groſs way) much as others do, yet declare themſelves to be underſtood more nicely.

And though our preſent *Gam-ut* take no notice of this little diverſity; yet, in Vocal Muſick, the Ear directs the Voice to a more juſt proportion. And, in String Muſick, it may in like manner be helped by ſtraining and ſlackening the Strings, or moving the Frets. But, in Wind Muſick, the Pipes are not capable of ſuch correction; and therefore we muſt be content with ſome little irregularity therein; that ſo they may tolerably anſwer (though not exactly) the different Compoſitions according to the different placing of *Mi* in the *Gam-ut*.

Now the Deſign of Mr. *Harris* ſeems to be this; either (by multiplying intermediate Pipes) to bring the Organ to a juſt Perfection: Or elſe (if that cannot be done) to reſt content with the little Imperfection that is; which though, by more Pipes, it may be ſomewhat abated, yet cannot be perfectly remedied. And in this I think we muſt acquieſce.

I am

SIR

Yours to ſerve you

Oxford June 27. 1698.

JOHN WALLIS.

III. *A Letter from Dr.* William Muſgrave, *Fellow of the Coll. of Phyſ. and R. S. to Dr.* Sloane, *concerning a Periodical Palſy.*

A *Periodical Palſy*, you will allow, is a very unuſual Diſtemper, I do not remember either from Books or Men, to have met with more than Two Inſtances of it. The *German Ephimerides* (*Dec.* 1. *Annis* 9. & 10. *iterumque Dec.* 2. *A.* 3.) mention a young Man in the Dutchy of *Wirtenburg*, who, for the Space of Twelve Years, ſpoke only One Hour in the Four and Twenty; and that always at the ſame time, *viz.* between Twelve and One of the Day. The other Inſtance has fallen within my own Obſervation: Being well acquainted with the Particulars of it, I will Report it to you:

I was in *Auguſt*, 1687. deſired, by a poor Woman at *Aſtrop-Wells*, to look on her Daughter. They both came from *Stow* in *Gloceſterſhire* (as they had often done) for Work. The Daughter was about Twenty One, of a Sanguin Complexion; and, as to private Matters, well enough: She had been for ſeveral Days leſs Active than uſual; and after that, had (a Week before I ſaw her) loſt her Speech, and the Uſe of her Legs: She reel'd like a Perſon Drunk, and was (by thoſe who knew not her Condition) often taken to be ſo; but, I think, unjuſtly; for ſhe had neither Money nor Intereſt to make her ſo. In her Legs there was little or no Senſe of Feeling; her Left Leg was drawn up as in a violent Cramp.

Her Ruddy Sanguin Look directed Bleeding; but that did not relieve her. I then gave her Spirit of *Sal Armon.* Succinated, Steel with Gentian, Amber, Caſtor, and other warm Cephalics. A Bliſter was laid on her

Neck. A Bath (of Wormwood, and other hot Herbs) prepared for her Legs; *Ung. Martiatum* uſed to anoint them after Bathing.

By theſe Means, ſhe was, in the Space of Three Days, able to ſpeak again; and in a little time, by the Help of Crutches, able to go. But then omitting the Medicines, tho' but one Day, loſt her Speech again; and, returning to them (eſpecially the Spirit) recovered it as ſoon.

When not able to ſpeak, ſhe had a manifeſt Alteration in her Face; the Strength and Tonick Vigour of it abated; her Eyes grew Dull, her Lips Pale. I have in this Juncture given her Thirty Drops of the Spirit: In the Space of Two Hours the Change has been ſurpriſing; her Eye has quickened, a Colour come over her Face, her Speech return'd.

In *July*, 1688. I was again at *Aſtrop*; whither the Mother (encouraged by the Succeſs of the laſt Year's Phyſick) brought her Daughter to me, and gave me the following Account of her, *viz.* That after the Phyſick I had (the Year before) preſcribed her, was all ſpent; Her Speech, and the Uſe of her Legs left her; firſt in *September*, 1687. particularly on a *Tueſday*, about Noon; that it return'd the *Saturday* following, near the ſame Hour: and that from *Michaelmas*, 1687. to the time of our Diſcourſe (which was on *July* 18 following) her Speech and Strength of Legs obſerved the ſame Period (of going off on *Tueſdays* every Week, and returning on *Saturdays*) with only Two Exceptions, *viz.* That once they returned on a *Friday*, another time not before *Sunday*.

She tells me, That her Daughter was, the preceding Winter, very Weak, and in Danger of Death; That her Appetite was much abated; That ſhe ſometimes choſe to eat Bread, Water, and Salt, boyl'd together; That

 now,

now, as the Summer came on, ſhe recovered ſome Degree of Strength; That ſhe had loſt no Senſe at any Time, beſides that of Feeling; which was by the firſt quantity of Medicines, reſtored effectually, and without Relapſe.

I underſtand from her, That the *Menſes* were regular, as to Period; but as to Quantity unequal; with this farther Obſervable, That when they were moſt, ſhe (the Daughter) was worſt.

I was inform'd alſo, That before her Speech uſed to go off, ſhe conſtantly loſt, for an Hour's Space, the Uſe of her Left Arm; That when her Speech was leaving her, ſhe would ſtammer out ſome few Words, and after this, on a ſudden, became Mute: That when, not able to ſpeak, ſhe often moan'd, and made a melancholly, complaining Noiſe: That, her Speech did uſe to return (as it went off) all on a ſudden, and at once.

She always had, as her Speach ceas'd, and Two Hours after it was gone, a pain in her Left Side, including Arm and Leg: Her left Foot was then Drawn up, as beforementioned: Her Face was high colour'd when ſhe loſt her Speech, pale when it return'd: No part of her Body wither'd, but ſhe whole; was generally cold.

Some time before ſhe was at firſt ſtruck Speechleſs, her Hands uſed to Tremble, but have been of late more ſteddy: Nor was ſhe now ſo Dull and Heavy as formerly; but for the generality more Brisk and Chearful than in her State of Health.

When ſhe has her Speech ſhe goes beſt; but is always forc'd to uſe a Stick, being never able to go ſteddily: She ſpeaks by Intervals, as diſtinctly as ever, and as loud; can ſing, when capable of ſpeaking; but at no other time.

This Account the Mother gives me of her Daughter, delivering it with a great deal of Country Simplicity; which recommended what ſhe ſaid. As to her ſelf, I found ſhe ſometimes had convulſive Fits; and tho' a poor labouring Woman, was extreamly Hyſterical.

I at the ſame time obſerv'd the Daughter, to have a pale ſickly Look; a heavy Eye, a low Pulſe; and to be much waſted in Fleſh. She continued in my Neighbourhood about Two Months. Curioſity (as well as Charity) prompted me to ſee her often. I did ſee her almoſt every Day for the whole time. I made both Mother and Daughter frequently repeat to me, the manner of the Fits, and (by croſs Interrogatories) endeavoured to catch them in differing Stories: But their Accounts were, in Subſtance always the ſame. I endeavour'd to diſcover ſome Matter of Fact, which might diſprove them; and to that Intent examin'd thoſe who were near them: But could light on no ſuch Inſtance.

I then repeated the former Courſe, furniſhing her with large Quantities of her old Medicines; and ſo diſmiſs'd her, with Orders to let me hear again from her, when the Phyſick ſhould be all ſpent.

In *September*, 1688. ſhe came (with her Mother) from *Stow* to *Oxon*, (that is almoſt Twenty Miles) on Foot; thank'd me for what I had directed her, and beg'd a farther Supply of Medicines. She accordingly had them, and by the 10th of *Nov.* following, was grown ſtrong, and to all Appearance, well as ever.

For Two Months then, laſt paſt, ſhe did go and ſpeak every Day, but not at all times of the Week; for her Speech left her (as formerly) on *Tueſdays*; but (now) return'd the next Day after Noon. Thus ſhe continued to the Summer following; not ſpeaking (in more than Twenty Months) on any one *Wedneſday* Morning.

In

In the Summer, 1689. hoping to compleat the Cure, I procured (by means of a Contribution made on purpoſe) for her, a large Stock of Medicines for the Winter following: but ſince that Summer have heard nothing more of her.

There were ſeveral Opinions concerning this young Woman; ſome (you will eaſily imagin) thought her Bewitch'd; others, that ſhe counterfeited: But the Favourers of one and the other of theſe Opinions, were equally Strangers to her Caſe.

Can it be ſuppoſed that a Girl of very ordinary Underſtanding (as indeed this was) and a Ruſtick Education, ſhould leave a Courſe of Living tolerably well, and (to the great Prejudice of her Health, and Danger of her Life) carry on, for the Space of Two Years, a Humour which depriv'd her of ſo much Converſation, and brought both her, and her Mother, to ſuch exceſſive Hardſhips and Neceſſities, extraordinary? Chooſe, at the ſame time to take vaſt Quantities of Phyſick (for ſuch ſhe was ſeen to take) gain Ground under the Uſe of that Phyſick; and in Proportion to it, loſe that Ground again, upon omitting; regain it upon reſuming her Phyſick; and this evidently, manifeſtly, and frequently, and yet all this while Diſſemble? Sir, I beg leave to ſay, I think it was not in her Power ſo to do.

Indeed Credulity argues Weakneſs of Mind; and is, deſervedly attended with Reproach. It is offenſive to Philoſophy; whoſe venerable Records it interlines with falſe Stories, and idle Tales. But on the other Hand, 'tis alſo true, that Scepticiſm is not leſs a Fault; for that alone renders the whole Book of Nature inſignificant. What can the cleareſt Experiment, or the beſt diſcovery import to him, who will not hear, who will not ſee?

Exon, June 4. 1698.

IV. *Of the Poſture-Maſter.*

IN the *Pall Mall* at *London*, lived one *Clark* (call'd, *The Poſture-Maſter*) that had ſuch an abſolute Command of all his Muſcles and Joints, that he can dis-joint almoſt his whole Body; ſo that he impos'd on our famous *Mullens*, who lookt on him in ſo miſerable a Condition, that he would not undertake his Cure: Tho' he was a well grown Fellow, yet he would appear in all the Deformities that can be imagin'd, as Hunch Back'd, Pot Belly'd, Sharp Breaſted; he dis-jointed his Arms, Shoulders, Legs and Thighs, that he will appear'd as great an Object of Pity as any; and he has often impos'd on the ſame Company, where he has been juſt before, to give him Money as a Cripple; he looking ſo much unlike himſelf, that they could not know him. I have ſeen him make his Hips ſtand out a conſiderable way from his Loins, and ſo high that they ſeem'd to invade the Place of his Back, in which Poſture he has ſo large a Belly, as tho' one of our Company had one of a conſiderable Size, yet it ſeem'd lank compar'd with his: He turns his Face into all Shapes, ſo that by himſelf he acts all the uncouth, demure, odd Faces of a Quaker's Meeting: I could not have conceiv'd it poſſible to have done what he did, unleſs I had ſeen it; and I am ſenſible how ſhort I am come to a full Deſcription of him: None certainly can deſcribe what he does, but himſelf. He began Young to bring his Body to it, and there are ſeveral Inſtances of Perſons that can move ſeveral of their Bones out of their Joints, uſing themſelves to it from Children.

V. *An*

V. *An Account of some Effects of* Papaver Corniculatum luteum, &c. *By Mr.* Ja. Newton.

IN my Itinerary from *London* to *Margaret Island*, and thence most by the Sea Shoar to the Lands End in *Cornwall*, to observe what Plants each Part produced, between *Pensants* and *Marketjew*, on the Sandy Shoar, there growing abundance of *Papaver Corniculatum Luteum*, or Horned Poppy, with a Yellow Flower, vulgarly called in *Hampshire* and *Dorsetshire*, *Squatmore*, or *Bruseroot*, (as I was there informed) where they use it against Bruises external and internal: Mr. *John Hancock*, an Apothecary in *Pensants*, gave me the following Account of its Effects on one *Charles Worth*, and others of his Family, dwelling at the Half-way House between *Pensants* and *Marketjew*, (*viz.*) That the said *Charles Worth*, causing a Pye to be made of the Roots of the said Poppy, supposing them to be Sea-Holly or Eringo Roots (for that by order of a Physician lately lodging at his House, they had made Pies thereof, which was very pleasant to them) but he eating of the aforesaid Poppy Pye (whilst hot) was presently taken with such a kind of *Delirium* as made him fancy that most what he saw was Gold, and calling for a Chamber Pot, being a white Earthen one, after having purged by Stool into it, he broke it into pieces, and bid the By-standers to save them, for they all were Gold, as was also (as he said) all the Pewter in the House (he then pointing to it). The Man and Maid Servants, having also eat of the same Pye, stript themselves quite naked, and so danced one against the other a long time. The Mistress, who was gone to Market, coming Home, and saying, How now, what is here a do? the Maid turn'd her Brich against her, and purging

purging ſtoutly, ſaid, There, Miſtreſs, is Gold for you. A Child in the Cradle having alſo taſted of the Pye, was much doſed, and turned its Mouth to and again, and thus they continued for ſome Days, and then became well. All which was confirmed to me by the Man and and Wife of the ſaid Houſe, where we then went to refreſh our ſelves (they then keeping a Publick Houſe).

Here it may be queried, whether the Yellow Colour the Flowers running in their Minds (which the eating of the Roots had now depraved) might not beget that Idea in them, to fancy moſt things to be Gold, they alſo being Yellow.

VI. *Part of a Letter from Sir* Robert Sibbald, *to Dr.* Sloane, *concerning ſeveral Stones voided by a Boy,* &c.

THis ſame Month of *June*, a rare Caſe occur'd to me in the Perſon of a Boy, going in the Thirteenth Year of his Age, Son to a Friend; this Boy had the Misfortune Four Weeks ago to fall backwards upon a Stone, againſt which the hinder Part of his Head was ſtruck with ſuch Force, that (as they who were thereby informed me) he lay the Fourth part of an Hour without Senſe, and the next Day vomited ſome Blood, he felt a Pain and Weight in the hinder part of his Head and Neck, and loſt Appetite. He concealed his Caſe, and ſo nothing was done for more than a Fortnight. After the Fall he went into the Country, and ſtayed a few Days,

Days, and as he was coming back he had a frequent Desire to Piss, and lighted from the Horse several times, but could make no Urine; he vomited in this time; the Suppression had continued Twenty Four Hours and more, when I came to visit him. He had a great Pain in his Head, a Pain in his Back and Groines, and in the Region of the Bladder, which was swell'd, and he could not suffer it to be touch'd. I caused some mild Diureticks to be given to him presently, anointed his Groines and the *Regio Pubis* with the usual Ointment, and caused a Clyster to be injected; upon which, that Night he passed first some Sand, and then some Urine by Spoonfuls. I caused him afterwards to be put in an half Bath of Appropriate Simples: He was the Days following let Blood and Purged; and because the Pain and Weight in his Head troubled him much, a Large Vescatory was applied to the *Nucha*, which discharged much Humour from it. While this was a doing, he past very much Sand of a Greyish and Whitish Colour; and after the first Purge, began to pass Stones by the Yard, of a considerable Bigness, with Pain in the Back sometime before they fell down, then in the Groines, or along the Ureters, and most in the Right Side, yet sometimes in the Left also. He found the Yard much dilated while they passed it, and he had a smarting Pain then and while the Urine flowed; the Stones came in with the first of the Urine: He got several Emulsions which had good Effect. Some of the Stones were Round, some Oval, some of these Shapes

Some of a Pyramidal Form, ſome Cubical. The Colours were different, ſome whitiſh, ſome brown, ſome blewiſh, ſome black, or of a dark Colour; the Conſiſtence of a ſandy Stone, and ſome looked like to Bricks, ſome in the thickneſs the Tenth Part of an Inch, ſome the Twelfth part of it, ſome half an Inch long; moſt of them approached to a Triangular Form. He found a Weight in the Bladder when they fell down; and he told me, he was ſenſible they came down the Ureters. He leaped and ran ſometimes to haſten their Deſcent. I was preſent when he paſt One, and I heard it fall into the Urinal, and ſaw it there; his Relations ſaw moſt of them when they were paſt. Theſe Stones are not made up of ſeveral Coats upon other (as many confirmed Stones are) but look like Bricks, and may eaſily be mouldred to Powder. In a Fortnights time he hath paſt above Threeſcore of them by the Yard.

Since my writing this, the Boy (who is but going Thirteen Years (as his Parents ſay) hath paſſed ſeveral Triangular Stones, ſome thicker than the Sixth part of an Inch; and upon the 20th and 21th Inſtant he hath paſſed Three by the Fundament, Two of them Triangular pretty big, and One as big as a little Plumb, but of the Shape of a Pear, of the ſame ſandy Conſiſtence as the former, and of a Greyiſh Colour. He hath paſt none by the Yard ſince he paſt theſe the other way.

I was inquiſitive about his Diet, and was told by his Parents, that for ſome Years that they lived near to the Shoar of the *Firth* of *Forth*, the Boy ran often after the Women that catched the Sand Eels (*Ammodites*) and brought Home his Pockets full of them, which oftentimes he boiled without taking Pains (as he ought) to free them of the Sand that ſtuck to them. This, with the Glutinous Juice of that Fiſh, and the Sand mixed with

with the Bread, and other Aliments he uſed, hath furniſhed abundant Matter for theſe Stones, it is like (ſince he never had any Symptome of this before the Fall he got of late) the Hurt in the Hinder Part of the Head might have occaſioned ſome Torpor in the Nerves, ſo that the *Fibrillæ* in the Kidneys could not act ſo vigorouſly (as need was) in the Separation and Expulſion of the Sand; and thus it came to gather and form into Stones. He continueth paſſing daily ſeveral of them with great Quantities of Sand, notwithſtanding the uſual Remedies are continued. This is a Specimen of the Art of Nature and her Mechaniſm, in giving ſuch various Shapes to theſe Stones, by directing the Matter ſo regularly to ſuch Forms. I ſhall give you ſome Caſes which ſhew her Power in diſſolving Stones, when coated and of a more united Texture.

The Firſt occur'd in a Worthy Friend of mine, a Reverend Divine now above the Seventieth Year of his Age. He, after he hath theſe Ten Years paſt ſuffered much from a confirmed Stone he hath in his Bladder, ſince the beginning of this laſt Winter he hath paſſed a vaſt Number of Slices of ſeveral Figures, many of them cornered and pointed, much of the thickneſs of a Shilling Sterling, white within and ſmooth, but without of a dark Colour, with Pain, and ſometimes a Suppreſſion of Urine for ſeveral Hours precedeth them; he maketh uſe of the uſual Remedies; in the Intervals he hath tolerable good Health. I was told by an expert Phyſician, a Friend of mine, of Two Patients of his, the One yet alive, who after paſſing an incredible Number of theſe Slices, is now in perfect Health, and free of that Diſeaſe. The other, who died long ago, after paſſing for a long time ſuch Slices, became free of the Diſeaſe, and when his Body was opened at his Death, no Stone nor Slices were found in his Bladder. So even in this obſtinate Diſeaſe, ſometimes *Natura eſt Medicatrix*.

VII.

VII. *Part of a Letter written by* Roelof Diodati, *Supream Director of the Council of* Mauricius; *to Mr.* Witſen, *Burger-Maſter of* Amſterdam, *and F. R. S. Dated* Auguſt 8. 1697. *Concerning an extraordinary Inundation in that Iſland.*

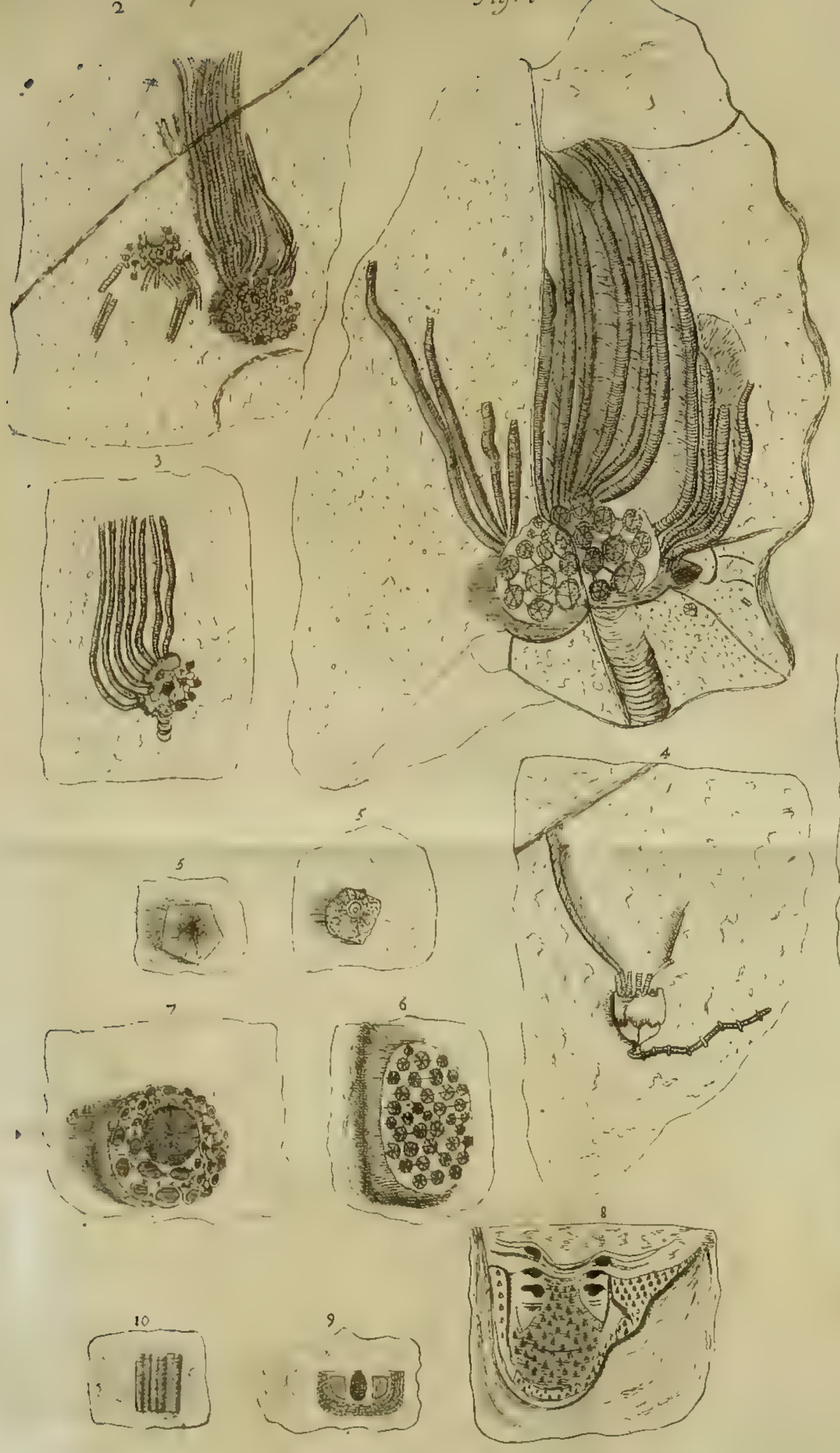
WE cannot but give your Worſhip notice, that on the 22th of *March* laſt, at half an Hour after Twelve a Clock, being Calm but a litte Rainy Weather, the River which paſſeth by the plain Ground of *Noordwyck*, did, in the ſpace of a quarter of an Hour, ſwell to that Height, that the Sugar-Mill, the Sugar-Work, and almoſt all the ſaid Ground was thereby ruin'd, the moſt part of the Sugar-Canes being rooted or torn out of the Ground by the Violence of the Torrent. We cannot imagine whence ſo ſuddain a Swelling of this River has been cauſed, while the Rain not being very hard, could not be of that effect, for in ſuch Caſe it ſhould have continued longer; for about Twelve a Clock, when the Company's Servants aſſembled for their Dinner, the Water of the River was at its ordinary Height, and before they had half dined all the Country was overflown by the Water, *viz.* One Foot higher than Two Years ago, by reaſon of the Hurricane, when we had ſo violent a Storm as ever was heard of. It is very remarkable, that at One a Clock all the Extraordinary Water was gone, and the River again at his ordinary Heighth. There has been no Earthquake that could cauſe it, neither was there any ſuch thing in other Rivers, but only in this paſſing by the plain Ground of *Noordwyck*.

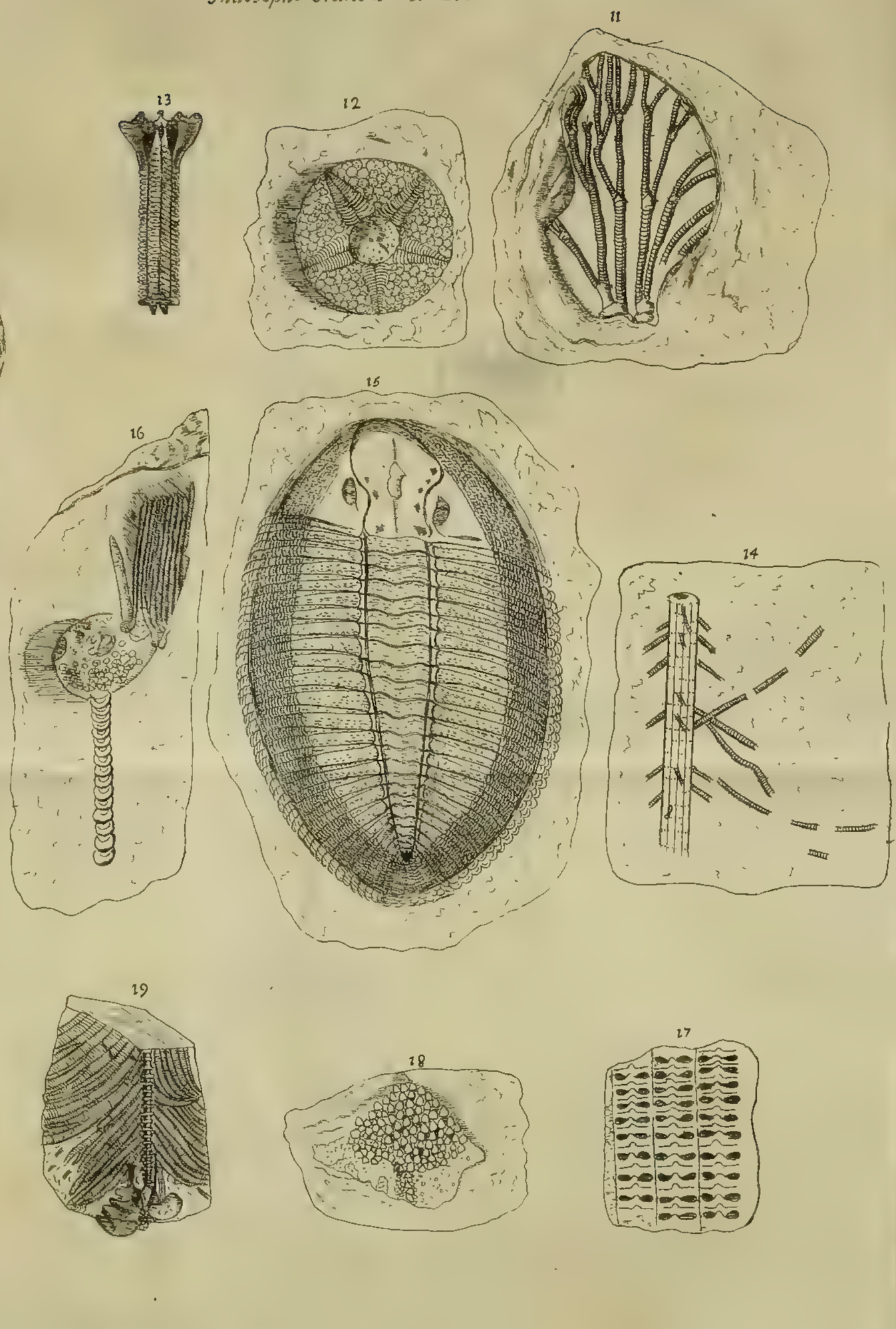
LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

Fig: 1

Philosoph: Transact: Nº 243:





PHILOSOPHICAL TRANSACTIONS.

For the Month of August, 1698.

The CONTENTS.

I. *Extract of the Minutes of the Philosophical Society at* Oxford, March 18. $168\frac{3}{4}$. *concerning Irish Slat.* II. *Some Observations sent from the* East-Indies; *being in Answer to some Queries sent thither by* Richard Waller, *Esq*; *F. R. S.* III. *Of the* Motion *of the* Stomach, *observ'd in a Dog, in* July, 1685. *By Dr.* Christopher Pitt. IV. *Part of a Letter from Mr.* Edw. Lhwyd *to Dr.* Martin Lister, *Fell. of the Coll. of Phys. and R. S. concerning several regularly Figured Stones lately found by him.* V. *Remarks concerning factitious Salts*; *drawn from a Discourse written*

ten by Seign. Franciſco Redi. VI. *A Letter from Dr.* Rob. Conny, *to the late Dr.* Rob. Plot, *F. R. S. concerning a Shower of Fiſhes.* VII. *The way of making Pitch, Tar, Roſin and Turpentine near* Marſeilles; *communicated in a Letter from Niſmes, by Mr.* Thomas Bent, *to Dr.* Welſted. VIII. *Extract from the Regiſters of the Philoſophical Society at* Oxford, October 7. 1684. *Concerning a Woman who voided the Bones of a* Fætus, *above the* Os Pubis, *and by other extraordinary ways.* IX. *Part of a Letter from Dr.* Aſhe, *Lord Biſhop of* Cloyne, *dated* March *the* 26*th* 1687. *concerning the Effects of Imagination, the Vertues of* Mackenboy, &c. X. *Extract from the Minutes of the Philoſophical Society at* Oxford, Feb. 8. $168\frac{3}{4}$. *concerning* Ruſma *and* Alcanna. XI. *To give Iron the Colour and Tincture of Copper. Communicated by the R^t. H^ble. Sir* Rob. Southwell, *V.P.R.S.* XII. *A way of Guilding Gold upon Silver. Communicated by the ſame.* XIII. *A Letter of Dr.* John Wallis, *to Mr.* Andrew Fletcher, *concerning the ſtrange Effects reported of* Muſick *in* Former Times, *beyond what is to be found in* Later Ages. XIV. *Account of Books.* 1. *Baſis Botanica; ſeu, Brevis ad rem Herbariam Manuductio, omnes Plantarum partes,*

una

una cum earumdem Virtutibus secundum novissima Botanicorum Fundamenta generali quadam Methodo commonstrans edita a D. Christano Ludovico Welschio Lipſ. 1697. 12*mo.*

2. *Juli Pflugk equitis Saxonici epistola ad per illustrem atq; Generosissimum Virum Ludovicum a Seckendorff virum de utraq; republica meritissimum, præter fata bibliothecæ Budensis, Librorum quoq; in ultima expugnatione repertorum catalogum exhibens Jen.* 1688. *in* 8*vo.*

3. *Dissertatione epistolare del fosforo minerale o sia della pietra illuminabile Bolognese, à sapienti ed eruditi signori Collettori degli acta eruditorum di Lipsia, Scritta da Luigi Ferdinando Conte Marsigli,* &c. *Lipſ.* 1698. *in* 4*to.*

XV. *A Catalogue of some Books lately Printed or now Printing beyond Sea.*

I. *Extract of the Minutes of the Philosophical Society at* Oxford, March 18. $168\frac{3}{4}$. *concerning Irish Slat.*

IT having been discours'd to us about Nine or Ten Months since, by the ingenious Mr. *Kenwrick*, Physician at *Worcester*, that the Irish Slat Pulveriz'd, and infus'd in Water for a Night, or less, would impart its Vitriolick Quality so far forth to it, that it would strike of

a

a faint reddiſh Colour with Powder of Galls (as the Vitriolic Waters of *Tunbridge*, *Aſtrop*, and divers others do, and as you ſee it has in ſome Meaſure done in the Example here before you) it not only led me to believe that theſe Waters, ſome of them, might as well iſſue from Slat as an Iron Oar; unleſs it ſhould appear, that this ſort of Slat were an Iron Oar too, which put me upon calcining it for Three or Four Hours after the manner of Dr. *Liſter*, to experiment, whether it would then (like the other Iron Oar) apply to the Magnet; wherein tho' I was altogether unſucceſsful, the Magnet not taking the leaſt notice of it, yet it afforded me another Diſcovery altogether as ſatisfactory, which is the Matter I have at preſent to communicate to you; *viz.* That upon Torrefaction it was all become a Yellow Ochre, and would ſcore like it; tho' this here I have to ſhew you, be grown a little too dark by much burning, which further perſwades me, that the Yellow, or rather Orange-coloured Sediment we find at the Bottom of theſe Fountains, comes rather from this ſort of Slat, than an Iron Ore; for I much queſtion whether ſome of the Yellow Ochres (tho' it's plain the Red ones do) come from, or are, Iron Ores; but I intend to calcine this further the next Week, whereof you ſhall have an Account the next Meeting, but doubt of my Succeſs, becauſe the *Shotover* Yellow Ochre will not own the Magnet after Thirty-ſix Hours Calcination, or better.

II. *Some*

II. *Some Observations sent from the* East-Indies; *being in Answer to some Queries sent thither by* Richard Waller, *Esq*; *F. R. S.*

IT does not appear that the *Maldiva-Islands* were ever joyn'd to the main Land, there being no Soundings, as they call it, between the Island and the Main, and the Earth, Sand and Shells of the one much differing from the other: The small Shells, called, *Cowries*, which pass for Money in *Bengale* and other places, are chiefly found there.

The North and South Pole are not visible under the Line, for in the cleerest Night the Horizon is over-cast with a thick mighty Darkness, that no Star can be seen. The Poles are seldom visible till they have Five or Six Degrees Latitude, though the Night be never so clear.

Gum Lack is the House of a large sort of Ants, which they make on the Boughs of Trees, which serves to keep them from the Weather, *&c.*

'Tis certain that Cloves will attract Water at some Distance, which is daily experienced amongst the Dutch in this Country, who make a considerable Advantage thereby. I have known a Bag of Cloves laid over Water One or Two Foot Distance, which has in a Night's time imbib'd a considerable Quantity of Water, and grown so moist that the Water might be press'd from them.

There has been seen an Oyster-Shell in *Bantam* that has been about Eighteen Inches Diameter, and several in *Maccao* that has been Eighteen Inches long, and Five or Six broad, whose Meat within has been proportionable to the Shell.

I am well inform'd by the Persons that did see it, that at *Batavia* a whole Duck was taken out of the Belly of a Snake; and that in *Achin* they did kill a Snake that had a whole Deer in its Belly, which they took out, being fresh and good, and that they did dress and eat part of the Deer.

They draw their Wire in Moulds of several Sizes, gradually, as we do; whether they have any Art to make it more Plyant I know not.

The *Chineses* Gild Paper with Leaf-Gold and Silver, laid on with a very good sort of Varnish they have, which is the same wherewith they Varnish their Lacker'd Wares; all which, after it is throughly dry, they put in a Screw-Press, and with an Instrument like our Plain, Shave it as fine as they Please; and so they cut their Tobacco, which is as fine as a Hair.

Amber Greece is found more or less in most Parts; great Quantities are found at *Japan*, and to the Eastward of *Java*, and at the *Maldiva-Islands*; which, they say, they find generally fastened to the Roots of Trees that grow in the Sea near the Shoar; and that while it is kept under Water 'tis Soft and Pliable like Wax, and sometimes like Gelly: There is now a Piece in *India*, which I have seen, that weighs above Two Thousand Ounces.

The People of *Java* Marry, and have Children at Nine and Ten Years of Age; and generally leave Childbearing at or before Thirty. At *Tunquin* there are Women common to any that will hire them, at Eight or Nine Years of Age.

The *Japan* and *China* Varnish is made of Turpentine and a curious sort of Oyl they have, which they mix and boyl to a convenient Consistence, which never causes any swelling in the Hands or Face, *&c.* of those that make or work it. The Swelling that often happens to

to thoſe that work the Lacker'd Ware, and ſometimes to thoſe that only paſs by the Shops and look on them at Work, is from the Lack, and not the Varniſh; which Lack is the Sap or Juice of a Tree which runs out ſlowly by cutting the Tree, and is catch'd by Pots faſtned to the Tree; 'tis of the Colour and Subſtance of Cream, the Top, that is expoſed to the Air, immediately turns Black, and the Way that they make it Black and fit for Uſe, is to put a ſmall Quantity in a Bowl, and ſtir it continually with a piece of ſmooth Iron for Twenty-four or Thirty Hours, which will both thicken it and make it black; to which they put a Quantity of very fine Powder of any ſort of burnt Boughs, and mix it very well together, and then with a Bruſh lay it ſmooth on any thing they deſign to Lack, then let it dry very well in the Sun, which will be harder than the Board it is laid on; when 'tis throughly dry you muſt rub it with a ſmooth Stone and Water till it is as ſmooth as Glaſs, and on that lay your Varniſh made of Turpentine and Oyl boil'd to a due Conſiſtance, for Black Lack: but if you would have Red, or any other colour'd Lack, you muſt mix your Colour in fine Powder with your Varniſh, and take care to lay your Varniſh on as ſmooth as poſſible you can, for therein lies the Art of Lacking well. If you would print in Gold or Silver, *&c.* you muſt with a fine Pencil dip'd in the ſaid Varniſh, draw what Flowers, Birds, *&c.* you pleaſe, and let it lye till it begins to be dry; then lay on your Leaf-Gold, or Silver, or Pin-Duſt, *&c.*

It is well known that there is amongſt the *Bramines* a Language called, the *Sanſcreet*, writ in a different Character from that now in Uſe; in which Language are written the *Porane*, or Sacred Hiſtory. The *Shaſtram* being to them what the Bible is to Chriſtians; and the Four Beads (whereof One is loſt) containing their Divi-

nity, Law, Phyſick, &c. and ſome other Books: This Language is not underſtood by all *Bramines*, but only by the Studious and Learned among them: I asked one of the moſt eminent among them in this Place, how long it was ſince the ſaid Language was loſt, who anſwered that it was ſpoke in the Age of the Gods, or when they lived upon Earth, which by their Calculation continued many Thouſand Years, and ended ſo many Years paſt as we reckon from the Flood, or thereabouts: but they have little Knowledge in Chronology. It's evident that ſeveral of the Languages now ſpoke in *India*, are derived from the *Sanſcreets*, and one of the *Bramines* writ a Book to ſhew that the preſent *Hindoſtan* or Language ſpoken by the Moors in particular, is derived from thence.

I have inquir'd of Two of the moſt knowing *Bramines* in this Town, and they both agree, that our *Sunday* in every Week was a Holy Day, or Day of Reſt with them, and for fear they ſhould abuſe me, I have asked a *Mowla* or Mahometan Prieſt, a Native of *India*, and one that always lived amongſt them, and he gave me the ſame Account. Beſides this they have their Monthly Holy Days; for the Eighth Day after the Change of the Moon is always a Day of Devotion; as alſo the Fourteenth and the Eleventh Days from the Change, a ſtrict Faſt, called *Jaka Daſee*, or *Taka Daſee*; ſo likewiſe the Eighth Day from the Full Moon, and the Fourteenth, are Days of Devotion, and the Eleventh a *Taka Daſee*: Beſides theſe they have throughout the Year ſeveral Feſtival Days and Times, as in other Religions.

Upon the Death of any Perſon, the next of Kin, eſpecially a Husband for a Wife, a Father for a Child, & *vice verſa*; as alſo a Brother for a Brother or Siſter deceaſed, do Mourn Fifteen Days, during which time they eat only Rice and Water, and are not either to eat Betle

or

or mark their Foreheads, but uſe ſeveral Waſhings, and Variety of other Ceremonies, as carrying of Victuals to Gardens, Groves, and *Tanques* to diſtribute and make ſeveral Prayers that God would grant the deceaſed Party a good Place in the other World, forgive him his Sins, be favourable unto him, *&c.* and upon the Sixteenth Day they make a Feaſt to all their Friends and Relations and thoſe of their own Coaſt, as they are able, and likewiſe Yearly upon the Day of his Death, they give Alms, *i. e.* Victuals to more or leſs poor People, as they are able, with whom they make Prayers for the Dead.

III. *Of the* Motion *of the* Stomach, *obſerv'd in in a Dog, in* July, 1685. *By Dr.* Chriſtopher Pitt.

§ 1. ANatomiſts in their Deſcription of Man's Body, tho' they ſometimes Make mention of the Motion of the Stomach, (as in Vomiting and in conveying the Meat that is Digeſted in the Stomach into the Inteſtines) yet giving no particular Deſcription of it from the Teſtimony of Sight, I hope it will be no ways impertinent in me to give an Account of it, as it appear'd to me in the Diſſection of a Dog, in *July*, 1685.

§ 2. In this Dog I obſerved that the Periſtaltick Motion of the Guts was continued thro' the Stomach; the Pylorus (that uſually appears, after opening the Dog, as high as the Diaphragm) being in every waving brought below the very Bottom of the Stomach, I could manifeſtly obſerve a Conſtriction in the middle of the Stomach, at every Motion Downward, paſſing it in ſo as to be able to compreſs what was contained in its Cavity. And theſe Motions were as regular and orderly as ever I ſaw it in the Guts; and appeared for a long time together; ſo that I could the more diligently make my Obſervations.

§ 3. I have ſeen the Motion of the Stomach in Two or Three that I have diſſected ſince, ſo that one may ſafely conclude it holds true in all.

§ 4. I ſuppoſe the Reaſon that it appear'd ſo manifeſtly and long in the Firſt Dog, was becauſe his Stomach being extreamly full, put the Fibres upon ſome Stretch; ſo that they (as all ſuch Bodies do) endeavour'd by their Motion to reſtore themſelves to their former Poſition.

And

And I am apt to believe that this is one of the main Cauſes of the Motion of the Stomach and Guts, and that they ſeldom move but when they have ſomething in their Cavity to diſtend their Fibres. But I'll not be too bold to make ſuch Deductions till farther Tryals make it appear true or falſe.

§ 5. The Motion of the Stomach being after this manner, may give us a clearer Account of the Quickneſs of the Diſtribution of the Nouriſhment, than any way I can find that Authors give us: the Meat being no ſooner opened by the Spittle and Liquor that we take in, than that it has a free Motion by the Deſcent of the Pylorus into the Inteſtines, which is almoſt *Pleno Flumine*, from the Compreſſion in the Middle of the Stomach.

IV. *Part of a Letter from* Mr. Edw. Lhwyd *to Dr.* Martin Liſter, *Fell. of the Coll. of Phyſ. and R. S. concerning ſeveral regularly Figured Stones lately found by him.*

I Should have troubled you with ſome ſort of Account of our Travels; which, as you'll find by the incloſed Draughts of figured Stones, has been tolerably ſucceſful. The 8, 9, and 15th we found near the *Lhan Deilo* in *Caermardhinſhire*; the 11, 13 17, 19. on the *Seavern* Shore in *Gloceſterſhire*; the 14th at *Gold Cliff* in *Monmouthſhire*; and all the reſt in the Iſle of *Caldey*, in this County. The 15th whereof we found great Plenty, muſt doubtleſs be referred to the Sceleton of ſome flat Fiſh; the 8th and 9th I know not at all what to make of: the reſt are *Modioli* or *Vertebræ* of Sea Stars; for I have been long ſince fully ſatisfied that all ſorts of *Entrochi* and *Aſteriæ* muſt be refer'd thither; not that I conclude

clude that either these, or any other Marine-terrestrial Bodies, were ever really, either Parts or *Exuviæ* of Animals; but that they bear the same Relation to the Sea-stars, that *Glossopetræ* do to the Teeth of Sharks; the Fossil Shells to the Marine ones, *&c.* These are scarce a Tenth Part of our Discoveries in this Kind, the last Year and the present; but some of them being *toto Genere* new, and the rest Improvements of your own and other Gentlemens Observations, I presum'd this faint Representation of them would be some Diversion to you. My Designer never practis'd before this Journey, but seems to improve daily, and would make something of it could we meet with either some Persons or Books to put him in the Way. You have done me, I doubt not, an unexpressible Kindness, by procuring a Correspondence with Mr. *Pezron*; I am yet so much a Stranger to his Works, that I never heard of his Name. His Notion of the Greek, Roman, and Celtic Languages being of one common Origin, agrees exactly with my Observations: But I have not advanced so far, as to discover the Celtic to be the Mother-Tongue, tho' perhaps he may not want good Grounds (at least plausible Arguments) for such an Assertion. The Irish comes in with us, and is a Dialect of the Old Latin, as the British is of the Greek: But the Gothick or Teutonick, tho' it has also much Affinity with us, must needs make a Band apart. I shall speedily write to him, and trouble him with a few Queries about their Armorican Antiquities, *&c.*

See the Figure.

V. *Remarks*

V. *Remarks concerning factitious Salts; drawn from a Discourse written by Sen.* Francisco Redi.

THE Happy Genius of the Cardinal *de Medici* favouring and promoting Mathematical and Philosophical Studies, as well as others, makes him among his most weighty Affairs, not pass by such things as may serve the Virtuoso's as well for Private as Publick Advantage, hence it is that Seignior *Francis Redi* has been induced to collect divers Writings and Observations made some Years past in *Florence*, about Vegetable Salts; which being not ready to be published, you will here receive an Extract of them, for the Satisfaction of the Curious, and the Improvement of Natural Knowledge, being hereby conducted into the Manner of extracting the Salts, their Quantity and Different Figures, as likewise their Virtue and Purging Quality.

Preparation and Circumstances.

1. Burn any sort of Herb, Flower, Fruit, Wood, or whatever it be, and make Ashes thereof, with the Ashes and with pure Water in its natural Temper make the Lye, which after straine through moist Paper or a Filtre, so that it becomes as clear as possible. Afterward put the Lye into a Glass Vessel, and let it remain in *Balneo Mariæ* until such time as a great part of it evaporates, according to the Proportion observed by those that are used to such Operations, and according as the Congelation of the Salt is desired to be more or less expedited or retarded.

2. If you keep the Lye to evaporate by the Fire in Veſſels of Earth Glaſed, you will loſe a great Quantity of the Salts, for that as the Lye grows thicker, the Salt penetrates the Bottom and Sides of the Veſſel of Earth, and is loſt.

3. The Quantity of Water to make the Lye of is not determined; for the moſt part 5 ℔ of Water will extract all the Salt from 2 ℔ of Aſhes.

4. The Aſhes whereof we have already made the Lye, and by Conſequence drawn out the Salt, may, if you burn the ſame again in a Brick Furnace, make you afterwards another new Lye, which uſually yields ſome ſmall Portion of Salt.

5. The Salts drawn in the manner aforeſaid, when the Air is Moiſt uſe to melt, to obviate this Inconvenience, when you burn the Materials to reduce them to Aſhes, 'tis requiſite to uſe with them a due Quantity of Sulphur, and if it happen the Aſhes ſhould be made to your Hand, you may mingle them with Sulphur, and keep the ſame to the Fire till ſuch time as it be burnt. By this Means the Salt will never come to run, but become more White and Chriſtalline.

6. There is no General Rule concerning the Quantity of Sulphur to be put into the Materials you thus Burn; you may nevertheleſs at a gueſs ſay, to a Hundred Pounds of Materials 4 or 5 ℥ of Sulphur are uſually ſufficient.

7. All the Salts have a peculiar and determined Figure, the which they always keep, altho' they are often reſolved into Water, and afterward congealed.

8. If in One only Liquid you diſſolve together Two or Three ſorts of Salt of different Figure, when they congeal, they all aſſume their ancient and Proper Figure, and this not only happens in *Factitious*, but alſo in *Mineral* Salts. If in a Veſſel full of Water you diſſolve equal or unequal Quantities of Vitriol of *Cyprus*, Roch Allum, and

aud of purified Nitre; this Water will be all of an Azure Colour: But when the Water is evaporated, you will ſee in the Veſſel, that the Vitriol, the Allum and the Nitre have re-aſſum'd diſtinctly their firſt natural Figures, and that the Vitriol hath recovered its moſt compleat Azure Colour, leaving the Nitre and the Allum with their uſual tranſparent Whiteneſs.

9. Altho' it be ſaid before, Number 7. That all the Salts have a proper and particular Figure, yet notwithſtanding all this, Seignior *Redi* hath obſerved, That ſome manner of Salts have Two, Three and Four ſorts of Figure. Two ſorts have been ſeen in the *Lettuce*, in the *Scorzoneras*, in the *Musk Melon*, the *Scopa*, in the Roots of *Eſula*, in the *Black Hellebore*, in *Endive*, in *Eye-bright*, in *Worm-wood*, in *Sorrel*, and in *Shoots of Vines*; Three ſorts in *Black Pepper*, and in *Incarnate Roſe*; Four ſorts in the Roots of *White Hellebore*.

10. Beſides the before-mentioned diverſity of Figures which are found in Salts, I have obſerved, that among all Salts of whatſoever Figure, there are found ſome Cubical; which, though they be never ſo often diſſolved and congealed, appear ſtill of a Cubical Figure, or inclining to it.

11. He knows not that it is a General Rule, that the different Parts of Herbs, Fruits, *&c.* make Diverſity in the Figures of their Salts; but he ſays particularly, That the Salt of the Leaves of Lawrel differ from that of the Wood, and that the Figure of the Salt of the Pulp of a Gourd differs from that of the Rind.

12. Many Salts of different Matter have the ſame Figure, or at leaſt very like: The Salt of *Cucumber* hath a Figure like the Salt of *Eye-bright*, *Mechoacam*, *Scopa*, and *Lettuce*; alſo the Salt of *Orange Flowers*, *Roſes*, *Ginger*, *Endive*, *Colloquintida*, *Scorzonera-Root*, *White Hellebore-Roots* and *Liquoriſh* are like one another, *Cole-*

worts and *Rosemary-Flowers* give a Salt of one and the same Figure, as likewise do among themselves *Vine-Branches*, *Sorrel*, *Black Pepper*, the Rind of *Pomgranates*, and the Roots of *Black Hellebore*.

13. To make the Bodies of the Salts when they congeal, rest distinct one from another (so as their Figures may be observed) and not be intangled and heaped together, 'tis necessary, he says, that very great Diligence be used in evaporating the Lye, for if that be wholly evaporated, or if too great a part thereof, the Salts make a confused Crust at the Bottom of the Vessel, if the Lyes are left too Weak, the Salts require a very long time to congeal in, 'tis Requisite therefore to use such a Diligence, which is not to be gained without long Practice. The Instruments for measuring the Weights of Liquids, may give a Rule, which if it be not General, will at least come very near it; the Lyes being reduced to a convenient Thickness, are put into little small Glasses closed with a Stopple, and kept in a dry shady Place, and you must expect by the Benefit of Time, that the Salts will congeal themselves into Christalline Stones, either in the Bottom or on the Sides of the Vessel.

14. Not all Herbs, nor Flowers, nor Fruits, nor Woods when they are burnt, render equally the same Quantity of Salt, but according to the Diversity of their Species, the Quantity of Salt which is drawn from their Ashes, is found different. The Seasons wherein the Plants are gathered make a great Diversity, as also does the Country, whether Montanous or Champaine, or Sea-Coast or Marshy or Moist.

15. All Matters burnt give not the same Quantity of Ashes, but there is great Diversity which you may see by the following Proofs, the great Part in the Year 1660. in the Time of the Most Serene Great Duke *Ferdinand* II. of Glorious Memory.

Pounds.

Pounds.	Vegetables.	Ashes. lb	℥	ʒ	Salts. lb	℥	ʒ
100	Of dryed Flowers of Oranges	4	06	00	00	00	05
800	Of Gourds new gathered which dryed in the Oven were 36 lb	4	00	00	00	10	00
400	Red Onions (being 720) roasted, the Coals turn'd to 16 lb to the Coals new added 4℥ of Sulphur.	1	06	00	00	02	02
150	Eyebright fresh, and afterwards stilled and burnt	5	00	00	00	04	00
120	Distill'd Roses	4	00	01			
100	Of Maidenhair	9	00	00	00	00	04
150	Roots of Black Hellebore, which dryed came to 50 lb	6	00	00	00	01	00
150	Roots of White Hellebore fresh, which dryed came to 50 lb	2	00	00	00	04	00
96	Roots dryed and burnt of fresh Esula	3	00	00	00	02	00
30	Roots of Liquorish	2	00	00	00	01	04
20	Pellitory	1	00	00	00	00	06
100	Green Endive	2	00	00	00	02	00
90	Green Bindweed	1	00	00	00	02	00
2000	Leaves of Lawrel	33	00	04	00	00	00
500	Leaves of Lawrel	6	00	00	00	10	00
1000	Water Mellons well ripe, the Seeds being taken	25	00	01	00	09	00
2400	Cucumbers	18	00	00	00	00	00
300	Wood of Ivy	9	00	00	00	00	00
50	Scorzonera dryed	8	00	00	00	00	00
300	Pine Apples, the Nuts taken out	3	00	00	00	00	00
150	Mugwort dryed	8	00	00	00	00	00
130	Leaves of *Cyprus*	6	00	00	00	00	00
10	Peele of Pomgranates dryed		08	00	00	00	00
2	Sassafras		00	00	00	00	00
12	*Lignum Sanctum*	2	06	00	00	00	00
4	Yellow Sanders		01	04	00	00	00
4	Black Pepper		02	04	00	00	00
30	Ginger	1	07	00	00	00	00
12	Turbith	1	00	00	00	00	00
	Wood of Firr	3	00	00	00	03	00
	Scopæ	16	00	01	00	04	00
	Scopæ	16	00	01	00	06	00

Heads of Old Garlick 32 lb were dryed in a Furnace and burnt, from the Aſhes there was hardly any Salt to be gathered.

Thirty Pounds of Wheat-Flower burnt in a Furnace with a little Sulphur, and burnt a new in a Potter's Oven, give 8 ℥ of very black Aſhes, the which being Baked again for Eight Days continually in a Brick Furnace, after the Lye was made, there could not be a Grain of Salt drawn. The like happen'd in 10 ℥ of Aſhes drawn from a Stare and a half of Bran, burnt firſt in the Furnace with Sulphur, and afterwards baked in a Potter's Oven, and in one of Bricks.

16. All the Salts whatever drawn from the Aſhes of Vegetables, taken by the Mouth, ſays he, have a Purging Faculty, and a great Meaſure more than what by ſome is believed in common Salt, which taken by the Mouth has little or none at all, or if it have any betwixt that of common Salt and Vegetables, the Proportion is but as Two to Eight.

17. This Solutive Faculty is of equal Energy in all the Salts in ſuch Manner that the Salt of Sumack, Peeles of Pomgranates, Mirtle Berries, or Maſtick Purges as much as the Salt of Rubarb, Sena Turbith, Mechoacan, and all other like purgative Drugs.

18. The Doſe to be uſed is the ſame in all the Salts, to wit, from Two Drachms and an half to half an Ounce, diſſolved in Six Ounces of common Water; and Broth he has obſerved by infinite Experiments, that half an Ounce uſes to Purge Three Pounds and a half, or Four, or thereabouts, of Matter more or leſs, according to the Complexions, and according to the Fulneſs of the Bodies.

19. In Purging he has found no difference betwixt theſe Salts that have ſharp Points, and thoſe that are obtuſe and blunt or cubical; he has made Proof very often in divers Perſons, cauſing the like cubical Stones of Cucumbers

bers, Ginger, Colewort, and of Liquoriſh to be picked out, and he has ſeen that they have worked with the ſame Energy as the moſt acute Hexagone Stones of the Salt of Pepper, of Carnation Roſes, of Mechoacan, of Coleworts, of Cucumbers, *&c.*

20. From the aforeſaid Obſervations, tho' you cannot eſtabliſh a certain Rule, you may nevertheleſs conjecture, not without ſome Reaſon, *Firſt*, That the Salt drawn from the Aſhes of Herbs, Flowers, and of Fruits, *&c.* do not conſerve the Virtue, and that Faculty which Phyſicians believe the Herbs, Flowers, Fruits, *&c.* are endowed with. *Secondly*, You may very near be certain of the Proportion of Aſhes riſing from each Species of Vegetables, and of the Quantity of Salt which is afterward to be drawn from them; and it will not be ungrateful to the Reader that I put here the Differences by me computed (of the Aſhes, after the rate of 100 Pounds of Vegetables, and of the Salts after the Rate of One Pound of Aſhes) and depoſed according to the Order of the Exceſſes.

A Table of the Aſhes which 100 ℔ *give.*

	℔	ʒ	ʒ	℈	*gr.*
Red Onions	00	04	04	00	00
Gourds	00	06	00	00	00
Cucumbers	00	09	00	00	00
Pine Nut-Shells	01	00	00	00	00
Yellow Sanders	01	00	04	00	00
Bindweeds	01	01	02	02	00
Laurel Leaves	01	02	00	00	00
Roots of White Hellebore	01	04	00	00	00
Other Leaves of Laurel	01	07	04	02	10
Endive	02	00	00	00	00
Wheat Flower	02	02	05	01	00
Water Melons	02	06	00	00	00

Ivy

	℔	℥	ʒ	℈	gr.
Ivy	03	00	00	00	00
Roots of Eſula	03	01	04	00	00
Saſſafras	03	01	04	00	00
Eyebright	03	04	00	00	00
Diſtill'd Roſes	03	04	00	00	00
Roots of Black Hellebore	04	00	00	00	00
Orange Flowers	04	06	00	00	00
Leaves of Cyprus	04	07	03	05	00
Pellitory	05	00	00	00	00
Black Pepper	05	02	04	00	00
Ginger	05	03	02	02	00
Mugwort	05	04	00	00	00
Pomgranate Bark	06	08	00	00	00
Roots of Liquoriſh	06	08	00	00	00
Turbith	08	04	00	00	00
Maiden-Hair diſtill'd	09	00	00	00	00
Scorzonera	16	00	00	00	00
Lignum Sanctum	20	10	00	00	00

A Table of the Salts which are extracted from One Pound of Aſhes.

	℔	℥	ʒ	℈	gr.
Maiden-Hair	00	00	00	01	08
Roots of Black Hellebore	00	00	00	04	00
Orange Flowers	00	00	01	00	08
Lawrel Leas	00	00	03	01	22
Root of Eſula					
Roots of Liquoriſh	00	00	06	00	00
Pellitory	00	00	06	00	00
Water Melons	00	00	06	01	11
Red Onions	00	00	07	01	00
Endive	00	01	00	00	00
Firr	00	01	00	00	00
Roots of White Hellebore	00	01	00	00	00

Scopæ

	℔	℥	ʒ	℈	*gr.*
Scopæ	00	01	00	00	00
Another	00	01	01	00	00
Eye-bright	00	01	01	01	09
Other Leaves of Lawrel	00	01	05	01	06
Bindweed	00	02	00	00	00
Gourds	00	02	04	00	00
Roſes	00	03	00	00	00

In this Table you ſee ſome Variation in the ſame Species of Vegetables, the which do not give always the ſame Quantity of Aſhes and Salt, and that which is conſiderable, ſome Vegetables, inſipid and cold, as Endive, Pompion, and Roſes, have given much more Salt than others of a ſtronger Savour, apertive, and inciſive, as the Onions, Hellebore, Lawrel, Maiden-Hair, and the Garlick which is ſo ſtrong, gives none at all: But it may perchance be ſaid, that in theſe there is a greater Quantity of Volatile Salt.

VI. *A Letter from Dr.* Rob. Conny, *to the late Dr.* Rob. Plot, *F. R. S. concerning a Shower of Fiſhes.*

SInce my laſt to you I have received an Account of the prodigious Rain you long ago deſired of me, and this Opportunity offering of conveying it ſafely to you I wou'd no longer delay it, and had I received the Account as you promiſed me of that of the Herrings, I might poſſibly have ſaid ſomewhat more, but I ſhall

now leave that to you. The Account I had from a Worthy Gentleman of this County, who had a Box full of these Fishes which he preserved, but that being mislaid, he could not perform his Promise of giving me some of them, which he says he will certainly do, whenever he finds it. The Account is thus:

On *Wednesday* before *Easter*, *Anno* 1666. a Pasture Field at *Cranstead* near *Wrotham* in *Kent*, about Two Acres, which is far from any part of the Sea or Branch of it, and a Place where are no Fish Ponds, but a Scarcity of Water, was all overspread with little Fishes, conceived to be rained down, there having been at that time a great Tempest of Thunder and Rain; the Fishes were about the Length of a Man's little Finger, and judged by all that saw them to be young Whitings, many of them were taken up and shewed to several Persons; the Field belonged to one *Ware* a Yeoman, who was at that *Easter-Sessions* one of the Grand Inquest, and carried some of them to the Sessions at *Maidstone* in *Kent*, and he showed them, among others, to Mr. *Lake*, a Bencher of the *Middle-Temple*, who had One of them and brought it to *London*, the Truth of it was averr'd by many that saw the Fishes lye scattered all over that Field, and none in other the Fields thereto adjoining: The Quantity of them was estimated to be about a Bushel, being all together. Mr. *Lake* gave the Charge at those Sessions.

VII. *The way of making Pitch, Tarr, Rosin and Turpentine near* Marseilles; *communicated in a Letter from Nismes, by Mr.* Thomas Bent, *to Dr.* Welsted.

FIve Leagues from *Marseilles* are very high Mountains, which are (for the most part) covered with Forests of Pine-Trees, which there grow wild, half a League out of the Road you see the making of Pitch, Tar, Rosin and Turpentine, which is thus; *viz.* in the Spring time when the Sap runs most, they pare off the Bark of the Pine to make the Sap run down into an Hole, which they cut at the Bottom to receive it, as it runs it leaves a Cream or Crust behind it, which they take and temper in Water and sell by a cheat for white Bees-Wax, that they make Flambeaus of, and is a great deal dearer; then they take up the Juice in Spoons from the Bottom, and after they have so gotten a good Quantity, they strain it through a Grocer's Basket, such as they put up their *Malaga* Raisins in, that which runs through easily is the common Turpentine; then they take that which remains above, and adding a sufficient Quantity of Water, distill in an Alembick, that which is so distill'd is Oyl of Turpentine, and the Calx that remains is common Rosin; then thy cut the Stock of the Tree into large Chips, and pile them hollow in a Cave, covering it on the Top with Tiles, but so as to let some Air come in to feed the Fire, then burning them there runs a thick Juice down to the bottom, where they may make a small Hole for it to run out at (a larger Hole would set it all in a Flame) and that which so runs out is Tar; then they take of that, and boiling it gently over again, to consume more of the Moisture, they set it to cool, which when cool is Pitch.

VIII. *Extract from the Regiſters of the Philoſophical Society at* Oxford, October 7. 1684. *Concerning a Woman who voided the Bones of a* Fætus, *above the* Os Pubis, *and by other extraordinary ways.*

Margaret Parry of the Pariſh of *Kintbury* in *Berkſhire*, in the Year 1668. was delivered of a Child, ſhe continued indifferently well Two or Three Days after her Delivery; then new Pains came upon her, and for Three Weeks together there came from her daily ſome Quantity of Corruption, with Pieces of Fleſh and Skin; and ſhe continued dangerouſly ill for about Eight Weeks, at the end of which time ſhe was relieved, as is ſuppoſed by taking a Potion which was preſcribed her; after Two Years ſhe began to breed again, had Three Children in the Three Years following, all which were drawn from her by Violence; during her lying in with the laſt of theſe Three Children, ſome Bones of a *Fætus* came from her, after this ſeveral other Bones came away with her *Catamenia*, and ſeveral (amongſt which were divers parts of the Skull, and ſome of the larger Bones of the Body of a *Fætus*) work'd their way by degrees through the Fleſh above the *Os Pubis*.

The Woman is now alive (*October* 1684.) and in Health; all the Children were born perfect.

IX. *Part of a Letter from Dr.* Aſhe, *Lord Biſhop of* Cloyne, *dated* March *the 26th* 1687. *concerning the Effects of Imagination the Vertues of* Mackenboy, &c.

LAſt *January* in the County of *Kilkenny* I obſerved a very remarkable Inſtance of the Force of Imagination upon the *Fætus*, 'twas a Girl called *Elizabeth Dooly*, of about Thirteen Years of Age, whoſe Mother being with Child of her, was frighted by a Cow as ſhe milked it, and hit with the Teat on the left Temple within One Eighth of an Inch from her Eye, in which very Place the Girl has a piece of Fleſh growing exactly like a Cows Teat in Bigneſs, Shape, *&c.* except that it has a Bone in the Midſt of it, which reaches above half the length, this Piece of Fleſh is perforated, and ſhe weeps through it, when ſhe laughs it wrinkles up, it grows in Proportion to the reſt of her Body, ſhe is as ſenſible there as in any other Part.

March the Third in the Evening we had very much Thunder, and that and the next Day the Mercury in the Barometer was much lower than ever I obſerved it, *viz.* but $\frac{4}{10}$ above Twenty Eight Inches.

On *Friday* Night, the 18th of this Month, I obſerved here the Occultation of *Saturn* by the Moon, which happened at 12*h.* 13′. 55″. it paſs'd directly under the midſt of the Moon's Diſcus, the ſpightful Clouds hindered our Emerſion.

Dr.

Dr. *Mullen* tryed lately an Experiment upon the famous *Iriſh* Herb called, *Mackenboy*, or *Tithimalus Hibernicus*, which is by the Natives reported to be ſo ſtrong a Purge, that even the carrying it about one in their Cloaths is ſufficient to produce the Effect; this fabulous Story which has long prevail'd, he prov'd falſe, by carrying its Roots for Three Days in his Pocket, without any Alteration of that ſort.

A Quarry of white Marble is lately diſcovered in the County of *Antrim*, a Specimen of which was brought to us; 'tis of an extreamly fine Grain, ſoft at firſt, but grows very hard afterwards, like your *Portland* Stone.

X. *Extract from the Minutes of the Philoſophical Society at* Oxford, Feb. 8. 268¾. *concerning* Ruſma *and* Alcanna.

DR. *Plot* ſhewed us ſome of the *Turkiſh Ruſma* and *Alcanna*, which he lately received from Mr. *Smith*, Student of *Chroſt-Church*, and Chaplain to the Factory at *Smyrna*, who writes of the Uſe of the *Ruſma* in manner following; The black Earth, which ſeems as if it were burnt, muſt be beaten in an Iron or Marble Mortar to a fine Powder, and ſifted diligently; when you uſe it take One part of the ſaid Powder, and Two Parts of unſlack'd Lime, put theſe mixed together into a Linnen Rag, which infuſe in warm Water the ſpace of a Quarter of an Hour, or till it becomes of a Black Colour, then apply to the Place from whence you would take the Hair; as ſoon as the Hair begins to be looſe, the part muſt be waſh'd with warm Water and Soap: Thus far of the *Ruſma*. The *Alcanna* is the Leaf of a Plant dried and powdered, which when ſteept a Night in Wine, will die the Nails Red.

XI. *To give Iron the Colour and Tincture of Copper. Communicated by Sir* Rob. Southwell, *F. R. S.*

TAke of ſmall thin Copper Pieces clean'd in the Fire ℥j. of *Aqua Fortis* ℥iij. which being together in a Glaſs the Copper in Three or Four Hours will be diſſolv'd, when 'tis cold you may uſe it, by waſhing with a Feather upon your Iron, that is preſently made clean and ſmooth and it will preſently take the Colour of Copper, when it cometh out with much rubbing you may renew it again, but if you do it twice together, the Iron will look black.

XII. *A way of Guilding Gold upon Silver. Communicated by the ſame.*

BEat a Ducket thin, and diſſolve it in Two Ounces of *Aqua Regia*, then dip therein a clean Rag, and let the ſame dry, and do it again and again till all the ſaid Liquor be ſoak'd up, then burn the ſaid Rag, and with the Tinder thereof let Silver be rub'd, uſing therewith a little Spittle, and if by chance the Silver will not take, then hold it to the Fire to take away all manner of Greaſe and it will not fail.

Memorandum, This Method is known to very few Goldſmiths in *Germany*.

XIII. *To*

XIII. *A Letter of* Dr. John Wallis, *to* Mr. Andrew Fletcher; *concerning the ſtrange Effects reported of* Muſick *in* Former Times, *beyond what is to be found in* Later Ages.

SIR, Oxford, Aug. 18. 1698.

THE Queſtion you lately propoſed to me (by a Friend of yours) concerning *Muſick*; was not, Whence it comes to paſs that *Muſick* hath ſo great an Influence or Efficacy on our Affections, Paſſions, Motions, *&c.* But whence it is that theſe great effects which are reported of *Muſick* in *Former Times*, (of *Orpheus*, *Amphion*, &c.) are not as well found to follow upon the Muſick of *Later Ages*.

If that firſt had been the Queſtion; Whence it is that Muſick Operates on our Fancies, Affections, Paſſions, Motions, *&c.* and not ours only, but of other Animals, (for it is manifeſt that Birds and Beaſts are affected with Muſical Notes as well as Men:) And even as things inanimate) for 'tis well known, that of two Uniſone-Strings, though at ſome diſtance, if one be ſtruck, the other will move.)

I ſay, if this were the Queſtion, I muſt, in anſwer to it, have diſcourſed of the Nature of Sounds, produced by ſome Subtile Motions in the Air, propagated and continued to the Ear and Organs of Hearing, and thence communicated to the Animal Spirits; which excite ſuitable Imaginations, Affections, Paſſions, *&c.* and theſe attended with conformable Motions and Actions, and according to the various Proportions, Meaſures, and Mixtures of ſuch Sounds, there do ariſe various Effects in the Mind or Imagination, ſuitable thereunto. Thus the rough

Muſick of Drums and Trumpets, is apt to produce Courage and Fierceneſs in Martial Minds; and more or leſs according to the Degrees of Roughneſs. And ſweeter Sounds of more ſedate Muſick, are apt to excite ſofter Paſſions, and of different Kinds and Degrees, according to the Slowneſs or Swiftneſs, Loudneſs or Calmneſs, Acuteneſs or Gravity, and the various Meaſures and Mixtures of ſuch Muſical Sounds. The Animal Spirits being apt to receive Impreſſions anſwerable to thoſe ſubtile Motions, communicated to them from the Organs of Hearing.

But the Queſtion you move is only of the *Comparative Effects* of Muſick reported to have been in the Days of old, beyond what appears upon that of later Ages.

In anſwer to which, there are many things to be conſidered:

1. I take it for granted, That much of thoſe Reports is highly *Hyperbolical*, and next door to *Fabulous*; according to the Humour of thoſe Ages, termed by Hiſtorians, *Tempus Mythicum*, (the *Fabulous Age*) for (whatever may be thought of Men, Beaſts and Birds, no Man can think that the Trees and Stones did Dance after their Pipe. And even in more modeſt Times, the Poetical Stories of *Olympus*, *Atlas*, and other Mountains, reaching up to Heaven, are much beyond what is now to be found in thoſe Parts where they are ſaid to have been; and many Mountains now well known (as the *Alps*, the *Apennines*, the Pike of *Teneriff*) are much higher than their *Atlas* or *Olympus*. And their Famed *Tyber* is but a Ditch compared with our *Thames*. And like Abatements we muſt allow to the *Hyperbolical* Elogies of their *Muſick*.

2. We muſt conſider, That Muſick (to any tolerable Degree) was then (if not a *New*, at leaſt) a *Rare* Thing, which the Ruſticks, on whom it is reported to have had ſuch

ſuch Effects, had never heard before: and *on ſuch*, a little Muſick will do great Feats. As we find at this Day, a Fiddle or a Bag-pipe, among a Company of Country Fellows and Wenches (who never knew better) or at a Country Morrice-Dance, will make them skip and ſhake their Heels notably. (And the like heretofore, to a Sheperd's Reed or Oaten-Pipe) And when ſome ſuch thing happened amongſt thoſe Ruſticks of Old, That, with ſomewhat of *Hyperbole*, would make a great Noiſe.

3. We are to conſider that their Muſick (even after it came to ſome good Degree of Perfection) was much more plain and ſimple than ours now a-days. They had not Conſorts of Two, Three, Four or more Parts or Voices: But one ſingle Voice or ſingle Inſtrument, a-part; which, to a rude Ear, is much more taking than more compounded Muſick. And we find that a ſimple Jig, ſung or play'd on a Fiddle or Bag Pipe, doth more affect a company of Ruſticks, than a ſet of Vials and Voices. For that is at a Pitch not above their Capacity; whereas this other confounds it, with a great Noiſe, but nothing diſtinguiſhable to their Capacity. Like ſome delicate Sauce made up of a Mixture of many Ingredients; which may yield an agreeable Taſte, but not ſo as to diſtinguiſh the particular Reliſh of any one: But Honey or Sugar by it ſelf, they could underſtand and Reliſh with a more particular Guſto.

4. We are to conſider, That *Muſick* with the Ancients was of a larger extent than what we call Muſick now a-days: For *Poetry* and *Dancing* (or comely Motion) were then accounted parts of Muſick, when Muſick arrived to ſome Perfection. Now we know that *Verſe* of it ſelf, if in good Meaſures and Affectionate Language, and this ſet to a Muſical Tune, and ſung by a decent Voice, and accompanied but with ſoft Muſick (inſtrumental) if

any, ſuch as not to drown or obſcure the emphatick Expreſſions (like what we call *Recitative-Muſick*) will work ſtrangely upon the Ear, and move Affections ſuitable to the Tune and Ditty; (whether Brisk and Pleaſant, or Soft and Pitiful, or Fierce and Angry, or Moderate and Sedate) eſpecially if attended with a Geſture and Action ſuitable. (For 'tis well known, that ſuitable Acting on a Stage, gives great Life to the Words.) Now all this together (which were all Ingredients in what they called Muſick) muſt needs operate ſtrongly on the Fancies and Affections of ordinary People, unacquainted with ſuch kind of Treatments. For, if the deliberate reading of a *Romance* (when well penn'd) will produce Mirth, Tears, Joy, Grief, Pitty, Wrath or Indignation, ſuitable to the reſpective Intents of it, much more would it ſo do, if accompanied with all thoſe Attendants.

5. You will ask perhaps, Why may not all this be now done, as well as that? I anſwer, no doubt it may, and with like Effect, if an Addreſs be made, in proper Words with moving Arguments, in juſt Meaſures (Poetical or Rhetorical) with the Emphatick Words, Words ſet in ſignal Places, pronounced with a good Voice, and a true Accent, and attended with a decent Geſture; and all theſe ſuitably adjuſted to the Paſſion, Affection, or temper of Mind, particularly deſigned to be produc'd, (be it joy, Love, Grief, Pitty, Courage or Indignation) will certainly now, as well as then, produce great Effects upon the Mind, eſpecially upon a Surprize, and where Perſons are not otherwiſe pre-engag'd: And if ſo managed as that you be (or ſeem to be) in earneſt; and, if not over-acted by apparent Affectation.

6. We

6. We are to consider that the usual Design of what we now call Musick, is very different from that of the Ancients. What we now call *Musick*, is but what they called *Harmonick*; which was but one Part of their Musick (consisting of Words, Verse, Voice, Tune, Instrument and Acting) and we are not to expect the same Effect of one Piece as of the whole. And, of their *Harmonick* at first, when we are told (by a great *Hyperbole*) that it did draw after it, not Men only, but Birds, Beasts, Trees and Stones: this is no more (bating the *Hyperbole*) but what we now see daily in a Country-Town; when Boys, and Girls, and Country-folk, run after a Bag-pipe or a Fidler (especially if they had never seen the like before); of which we are apt (even now) to say, All the Town runs after the Fidler; or, the Fidler draws all the Town after him; or, as when they flock about a Ballad-Singer in a Fair, or the Morrice-Dancers at a *Whitsund Ale*. And all their Hyperbole's can signifie no more but this; when their Musick was but a Reed or an open Pipe.

7. It's true, that when Musick was arrived to greater Perfection, it was then applied to particular Designs of exciting this or that particular Affection, Passion or Temper of Mind; (as Courage to Soldiers in the Field; Love, in an Amorous Address; Tears and Pitty, in a Doleful Ditty; Fury and Indignation, in a Fiercer Tune; and a Sedate Temper when applyed to compose or pacify a Furious Quarrel;) the Tunes and Measures being suitably adapted to such Designs.

8. But such Designs as those, seem almost quite neglected in our present Musick. The chief Design now, in our most accomplish'd Musick, being to please the Ear; when, by a sweet Mixture of different Parts and Voices, with just Cadences and Concords intermix'd, a Grateful Sound

Sound is produced to pleaſe the Ear; (as a Cook's well tempered Sauce doth the Palate;) which to a common Ear is only a confuſed Noiſe of they know not what (though ſomewhat Pleaſing) while only the judicious Muſician can diſcern and diſtinguiſh the juſt Proportions.

9. 'Tis true, that even this Compound Muſick admits of different Characters; ſome is more Brisk and Airy; others more Sedate and Grave; others more Languid; as the different Subjects do require. But that which is moſt proper to excite particular Paſſions or Diſpoſitions, is ſuch as is more ſimple and uncompounded: ſuch as a Nurſes Languid Tune, lulling her Babe to ſleep; or a continued reading in an even Tone; or even the ſoft Murmur of a little Rivulet, running upon Gravel or Pibbles, inducing a quiet Repoſe of the Spirits: And contrarywiſe, the Briskneſs of a Jig, on a Kit or Violine, exciting to Dance. Which are more Operative to ſuch particular Ends, than an elaborate Compoſition of Full Muſick: Which Two differ as much as that of a Cook's mixing a Sauce to make it Palatable; and that of a Phyſician mixing a Potion for curing a particular Diſtemper, or procuring a juſt Habit of Body (where yet, a little Sugar to ſweeten it may not do amiſs.)

10. To conclude then; If we aim only at pleaſing the Ear, by a ſweet Conſort, I doubt not but our modern Compoſitions may equal, if not exceed thoſe of the Ancients: Amongſt whom I do not find any Foot-ſteps of what we call ſeveral Parts or Voices, (as Baſs, Treble, Mean, &c. ſung in Conſort) anſwering each other to compleat the Muſick. But if we would have our Muſick ſo adjuſted as to excite particular Paſſion, Affections, or Temper of Mind (as that of the Ancients is ſuppoſed to have done) we muſt then imitate the Phyſician rather than

than the Cook; and apply more ſimple Ingredients, fitted to the Temper we would produce. For in the ſweet Mixture of compounded Muſick, one thing doth ſo correct another, that it doth not operate ſtrongly any one way. And this, I doubt not, but a judicious Compoſer may ſo effect, (that with the Help of ſuch Hyperbole's, as with which the Ancient Muſick is wont to be ſet off) our Muſick may be ſaid to do as great Feats as any of theirs. I am,

SIR,

Your very Humble Servant,

JOHN WALLIS.

XIV. *An*

XIV. An Account of Books.

1. *Baſis Botanica; ſeu, Brevis ad rem Herbariam Manuductio, omnes Plantarum partes, una cum earumdem Virtutibus ſecundum noviſſima Botanicorum Fundamenta generali quadam Methodo commonſtrans edita a D.* Chriſtano Ludovico Welſchio Lipſ. 1697. 12*mo.*

THE Author of this Treatiſe, who was a Diſciple of Dr. *Herman's*, profeſſes to follow chiefly *Jungius*, *Hermannus*, *Rivinus*, and Mr. *Ray* in it. After giving an Account of the Uſefulneſs of the Study of Herbs, he divides Plants into Trees, Shrubs and Plants. He treats afterwards of their Root, *Fundus*, Stalk, Leaf, Flower and Fruit: From the Two laſt of which he thinks the Plant ought to have its place. He has likewiſe ſome Rules concerning the Virtues of Plants. But the greateſt part of the Book is a Catalogue of the moſt part of the Plants growing in their Climate, whether Wild or in Gardens.

2. *Juli Pflugk equitis Saxonici epistola ad perillustrem atq; Generosissimum Virum Ludovicum à Seckendorff Virum de utraq; republica meritissimum, præter fata bibliothecæ Budensis, librorum quoq; in ultima expugnatione repertorum catalogum exhibens. Jen.* 1688. *in* 8vo.

THis Letter (which has about 112 pages) was intended to be published at the Request of *Daniel Georgius Morhofius* sooner, had not the Author thought *Tollius* would have undertook this Task. This Library was first gathered by *Matthias Corvinus* (who died *An.* 1490.) from all parts of the World, consisting both of Printed Books and Manuscripts; Printing being then Young, he kept Writers in many Places to enrich his Library in what it wanted from Greek, he got many Hebrew, Greek and Latin Books from *Constantinople* and *Greece*, when those Places were taken; 40 or 50000 Books were said to be in the Library, of Printed and Manuscript. *Bosmannus Cardinalis* offer'd the *Turks* for them 200000 *Nummi Imperiales*. When *Buda* was taken by the *Turks*, this Library was pillag'd by the Soldiers, *Busbeckius* bought many of them, and brought them to *Vienna*; *Johannes Sambucus* purchased many of them, which are now also the Emperor's. *Billibaldus Birckheimerus*, got some which now belong to the Royal Society. The Remainder which was at *Buda* when it was taken, are here given an Account of in a Catalogue taken by a Missionary Jesuit. At the Close of the Book is a Catalogue of some Manuscripts formerly belonging to this Library, which are now in that of the Duke of *Wolfenbutell*.

3. *Dissertatione epistolare del fosforo minerale o sia della pietra illuminabile Bologneſe, à Sapienti ed eruditi signori Collettori degli acta eruditorum di Lipsia, scritta da Luigi Ferdinando Conte Marsigli, &c. Lipſ.* 1698. *in* 4*to.*

THis Dissertation which has 31 Pages, was designed to be presented from the Author to Mr. *Boyle*, but has been laid aside since his Death till now. This *Bononian-Stone* is found Three Miles from *Bononia* in the Mountain *Paderno*, or Eight Miles westward from thence, in that Hill called *Predalbino*. There are found with it Red-bole, Efflorescences of Salt, round and square Marcasites, and Plaister Gypsum or Gesso.

He describes the Fibres of the Stone which many times run to a common Center, which is some Earth. To make it shine, it is prepared by grating the Stone smooth with a File, dipping it in Brandy; after which it is rouled in some fine Powder of the same Stone, and calcin'd in an open Furnace, being plac'd in the middle of live Charcoal. When the Stone is calcin'd the Crust is taken off, and the Surface of the Stone, which is become Yellowish, when expos'd to the Light Air, imbibes the Light, and Shines like a Coal in the Dark. It will not be calcin'd into Lime. The Stone shines in Water, and receives the Light in Oyl of Nuts, but will not emit it till it be out of it.

At the End of this Treatise is an Account of Plaister or Gesso, of the several Kinds of it, and where they are dug. He tells us, That the Workers in it, in some Days time, are cured of the Itch, either by means of its adstringent Quality or Sulphur.

The whole Treatise is illustrated with variety of Figures.

XV. *A Catalogue of ſome Books lately Printed, or now Printing beyond Sea.*

VIaggio D'Italia in Inghelterra, deſcritione Geografico-hiſtorica ſacro-profana, antico-moderna e naturale, del padre Maeſtro Vincenzio Coronelli Ven. 1697. 2 Vol. in 8vo.

Ephemerides Barometricæ Mutinenſes anni 1694. una cum diſquiſitione cauſæ aſcenſus ac deſcenſus Mercurii in Torricelliana fiſtula juxta diverſum aeris ſtatum Bernardini Rammazini, his acceſſere epiſtolæ Jo.Bapt. Boccabadati & D. Franciſci Torti. Mutin. 1695. in 8vo.

Della natura de 'fuimi Trattato fiſico-matematico del Dottore Domenico Guglielmini in cui ſi manifeſtano le principale proprieta de fiumi ſe n'dicano molte ſin hora non conoſciute, e ſi dimoſtrano d'una maniera facile le cauſe delle medeſime, Bol. 1697. 4to.

Hiſtoire nouvelle des anciens Ducs, & autres Souverains de l'achipel. avec la deſcription des Iſles, & des choſes les plus remarqu'ables qui ſy' voyent encore aujourd'huy. Paris, 1698. 12*mo.*

The following Book is printing at Helmſtad, *in Folio.*

Hiſtoria Horti Helmſtadienſis Plantarum maximam partem exoticarum & rariorum ſub cœlo Academiæ Juliæ hactenus propagatarum Nomina, Deſcriptiones, Culturam & Vires nec non inſigniores nonnullarum Icones exhibens Opera *Johannis Andreæ Stiſſeri*, Med. Prof. Ord.

ADVER-

ADVERTISEMENT.

THE First Paper published Numb. 242. p. 246. *was sent or brought out of* Ireland *by Mr.* Keneda, *an Apothecary in* Edenburgh, *and communicated by him to Sir* Rob. Sibald, *Dr.* Balfour, *and some others, about Seventeen Years ago.*

ERRATA.

NUmb. 24. Page 180. in the last Line save Three dele *the*, p. 181. l. 14, 15. read *a burning Heat in*, &c. l 23 read *Throbbing of the Heart*. p. 182. l. 9. read *in the same time*. l. 22. for *which* read *and*. l. 26,27. a parenthesis to begin at (*either*; end at *any other way*.) Let that whole Paragraph end thus, *do, in some measure, argue the Probability of such a Passage*. p. 184. l. 6. read *measure*. l. 6, 7. read *Man of an extraordinary Size was communicated*, &c.

Numb. 242. p. 259. l. 23. read *but the whole generally cold*. p. 261. l. 23. after *it*, place a Colon.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

PHILOSOPHICAL TRANSACTIONS.

For the Month of September, 1698.

The CONTENTS.

I. *Part of a Letter from* Ralph Thoresby, *Esq*; *F. R. S. to* John Evelyn, *Esq*; *F. R. S. concerning some* Roman Antiquities *lately found in* Yorkshire. II. *An* Account *of some* Indian Plants, *&c. with their* Names, Descriptions *and* Vertues; *Communicated in a Letter from Mr.* James Petiver, Apothecary, *and* Fellow *of the* Royal Society; *to Mr.* Samuel Brown, Surgeon, *at* Fort St. George. III. *Part of a Letter from Mr.* Butterfield *from* Paris, Sept. 7. 1698. *to Dr.* Martin Lister, *Fellow of the Colledge of Physicians and R. S. concerning Magnetical Sand.* IV. *An Ob-*

jection to the new Hypotheſis of the Generation of Animals from Animalcula in Semine Maſculino. *By Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians and Royal Society.*

V. *An Abſtract with ſome Reflections on a new Account of* Eaſt-India *and* Perſia, *in Eight Letters, being Nine Years Travels, begun* 1672. *and finiſhed* 1681, &c. *By* John Fryer, *M. D.* Cantabrig. *and Fellow of the Royal Society. Printed for* R. Chiſwel *at the* Roſe *and* Crown *in St.* Paul's *Church-Yard.* 1698.

I. *Part of a Letter from* Ralph Thoresby, *Eſq; F. R. S. to* John Evelyn, *Eſq; F. R. S. concerning ſome* Roman Antiquities *lately found in* Yorkſhire.

SIX Months ago I ſent to Dr. *Liſter* a large Account of the Texture and Figure of an old *Roman Shield* of the *Parma* Kind, that I had then newly procured; I have ſince got another Curioſity relating to their *Plaſticks*, 'tis part of the Bottom (which conſiſted of ſeveral ſuch Pieces for the Conveniency of Baking) of an old *Roman Coffin*, that was lately dug up in their Burying-Place out of *Boutham-Bar* at *York*, (whence I had the Bricks and Urns mentioned in the laſt *November* Tranſactions) 'tis of the Red Clay but not ſo fine as the Urns, having a greater Quantity of courſe Sand wrought in with the Clay; as to the Form (which is entire as it was at firſt moulded) 'tis Fourteen Inches and an half long, and about

about Eleven broad at the narrower End, and nigh Twelve and an half at the broader; this was the loweſt part, for the Feet and the reſt were proportionably broader till it came to the Shoulders; 'tis an Inch thick beſides the Ledges, which are One broad and Two thick, and extend from the bottom of either ſide to within Three Inches of the top, where 'tis wholly flat, and ſomewhat thinner for the next to lye upon it, which ſeveral Parts were thus joyn'd together by ſome Pin, I preſume, for at the end of each Tile is a Hole that wou'd receive a common Slate-Pin, theſe Edges are wrought a little hollow, to receive the Sides, I ſuppoſe, and at the Feet are Two contrary Notches to faſten the End-piece, this Bottom I ſhould conclude to have conſiſted ſtrictly of Eight ſuch Parts, from a like Character 8 impreſt upon the Clay by the *Sandapilarius*'s Finger before its Baking, but that I ſomewhat doubt whether *Numeral Figures* be of that Antiquity in theſe *European* Parts, tho' I ſee no reaſon to conclude that becauſe the *Romans* uſed the *Numeral Letters* upon their more durable Monuments, that they were utterly Strangers to theſe Figures, which (notwithſtanding the common Opinion of their Novelty here) the learned Dr. *Wallis* thinks as old at leaſt, as the Times of *Hermannus Contractus*, *An. Dom.* 1050. and produces an unexceptionable Teſtimony of their Uſe here in *England An.* 1133. (*Philoſoph. Tranſact.* Numb. 154.) I got alſo ſome Scars of broken Urns, dug up in Mr. *Giles*'s Garden, which are of the fineſt blew Clay I have ſeen, with which was found a *Roman Shuttle*, about Three Inches and an half long, but not one broad in the very middle, the hollow for the *Licium* being but one fourth of an Inch in the broadeſt Place, ſhews that it was either for Silk or very fine Linnen, perhaps their *Aſbeſtinum* or Incombuſtible Winding-Sheets. I have alſo lately procur'd a *Roman Pottle* from *Aldbrough*,

brough, which is of the Red Clay, but much courſer than the *York* Urns: I was well pleaſed to find it whole, that I might obſerve the difference betwixt their *Congius* (of which I take this to be ſtrictly the half) and our *Gallon*, and this comes the nigheſt Mr. *Graves*'s Computation, containing Three Pints and an half the *Wincheſter* Meaſure.

The laſt Week I received a valuable Preſent of Two and Twenty old *Roman Coins*, from Mr. *Townely* of *Townely*, which were lately found in the Pariſh of *Burnley* in *Lancaſhire*, which are the more acceptable, becauſe many of them are *Conſular*, or Family Coins, one of them, *viz. Q. Caſſius*, was 162 Years *ante Chriſtum* according to *Goltzius*'s Method, being ſtrictly the ſame he places *An. Urb. Cond.* 589.

That they were the ancient *Roman Denarii*, and Coin'd before the Emperors Times (notwithſtanding the contrary Sentiments of ſome Learned Men) I think is evident, becauſe there is moſtly, inſtead of the Emperor's Head, the antick Form of the *Caput Urbis*, without Inſcription, beſides, *Tacitus* calls theſe *Bigati* and *Quadrigati*, *pecuniam veterem ac diu notam*: Again others have upon them ROMA, which I find not uſed by any of the Emperors, (except thoſe ſmall Pieces upon the Tranſlation of the Empire to *Conſtantinople*) again, the Letters in theſe are often interwoven, as particularly V-L in one I have of *L. Valerius Flaccus* A.V.C. CDXCII. which according to *Goltzius*, is the Seventh Year after the *Romans* firſt ſtampt Silver Monies; and to mention no more, many are of the *Serrato's* filed in ſmall Notches round the Edge, of which Sort I have of *Scipio Aſiaticus*, *&c.* and other *Conſular* Pieces, but never ſaw any of a later Date.

II. *An*

II. *An* Account *of ſome* Indian Plants, *&c. with their* Names, Deſcriptions *and* Vertues; *Communicated in a Letter from Mr.* James Petiver, Apothecary *and* Fellow *of the* Royal Society; *to Mr.* Samuel Brown, Surgeon *at* Fort St. George.

SIR,

MY Opinion of the Plants you collected at *Unanercoonda*, about Twelve Miles from *Fort St. George*, as you deſired, are as follows; in the ſame *Order*, and under thoſe *Malabar Names* and *Numbers* you ſent them to me: *viz.*

1. Vellaiengeel maraum *Malabar.* 1.

Arbor Madraſpatana floribus hexapetalis heptapetaliſve, fructu coronato. Names.

This is a ſort of *Angolam*, of which there are Two Kinds deſcribed in the *Hortus Malabaricus*, *viz.* Vol. 4. Tab. 17. Pag. 39. and Tab. 26. p. 55.

The *Fruit* of this having but one round flat *Kernel*, agrees with the *Deſcription* of the laſt, but the Leaves ſeem rather to reſemble the firſt, *viz.* thoſe in *Tab.* 17.

N. B. You ſay, where *Maraum* is added it ſignifies a *great Tree*; the ſame I have formerly remarkt in the *Hort. Malabar.* of *Mara* and *Maram.* vid. Comel. in Not. H. Mal. Vol. 2. Tab. 49. p. 96.

2. Naiureevee *Malab.* 2.

Dr. *Plukenet*, that moſt accurate Botaniſt in his *Phytographia*, Tab. 10. Fig. 4, calls this *Amaranthus ſpicatus Dictamni Cretici folio* Maderaſpatenſis, *whoſe Figure* re- Names.

 ſembles

ſembles this Plant very well while young, but the Leaves when full grown, are much larger, and the Spike longer, generally turning inwards. The *Hortus Malabaricus* ſeems to deſcribe this in the *10th Volum*, Tab. 78. Pag. 155. under the Name of *Cadelari*, which the *Brachmans* or *Brammins* call *Cante Mogaro*, aſcribing theſe *Vertues* to it, *viz.*

Vertues. That the *Decoction* takes away *Swellings*, abates the Sharpneſs of *Urine*, and eaſes the *Stone*; mixt with the *Oyl Sergelin* it ſtops piſſing of Blood. The *Root* purges; being bruiſed and boyl'd in *Butter*, it cures a *Dyſentery*; a *Drink* of it ſtrengthens the *Stomach*, expels *Wind*, corrects *Phlegm*, and breaks the *Stone* in the *Bladder*; being applied to the Arm it cures *Agues*; bruiſed and drank in Wine is good for the *Gravel*, provoking *Urine*, eſpecially in *Hydropick Perſons*; mixt with *Lemons* it kills *Tettars*, and takes away Swellings under the *Chin*, *&c.* the *Seed* powder'd and ſnuft up the Noſe cures the *Head ach.*

Joannes Commelinus, in his Notes on the *Hortus Malab.* takes this Plant to be the *Verbena Indica* Bontii *in his* Hiſtor. Natural. *Lib. 6.* cap. 54. p. 150. (and I think not improperly) therefore it may not, I hope, be amiſs to ſubjoin its *Vertues* with the aforegoing, *viz.*

That the *Natives* of *Java* and they themſelves having learnt of them, apply the *Leaves* of this Plant bruiſed to *Ulcers* in the *Thighs* with good Succeſs; becauſe it dries very much, which Quality is there very beneficial, by reaſon the Conſtitution of the *Air* in thoſe parts is *hot* and *moiſt*, which renders the *Ulcers* very ſtubborn and difficult to cure.

They give alſo a Spoonful of the freſh Juice of it in *Colick* Pains, *Dyſenteries*, and without Diſtinction in all affects of the Bowels with very great Succeſs; being bruiſed

bruiſed and mixt with *Vinegar*, they apply it to the *Breaſt* in Swoonings, and all fainting Fits.

He farther ſays, the *Indian* Old Women eſteem it there as a ſacred Herb, and hold it very good for ſuch as are *Bewitcht*, or under an *Evil Tongue*.

This nicely differs from the *Amaranthus* Siculus *ſpicatus radice perenni* Bocconi, *Tab.* 9 p. 16. in having rounder Leaves, and thoſe leſs white or hoary underneath. *Comparative Difference.*

3. Nucheela *Malab.* 3.

Vitex Madraſpatana *foliis latioribus digitatis, floribus racemoſis.* *Names.*

This *differs* from the *Common* in having its *Leaves* ſomewhat broader, and its *Flowers* more ſparſt (or ſpread abroad) like thoſe of *Grapes* on ſhort Footſtalks, whereas the *Common* grows cloſe and at ſet Diſtances, like the *Whorles* on a *Verticillated Plant*. *Comparative Difference.*

The *Fruit* in Bigneſs and Colour reſembles *Black* and *Pepper*, but is ſmooth and ſhining, ſet in a large Bell-faſhioned cinereous *Calyx* or *Cup*, and covers about half the *Fruit*, which is very hard, and ſo ſolid, that you can ſcarce diſtinguiſh any *Kernel* it hath, but as it were, an intire woody Subſtance and altogether *inſipid*. *Deſcription.*

4. Nella poonee *Malab.* 4.

Arbuſcula Madraſpatana *floribus exiguis racemiferis.* *Names.*

The *Leaves* of this are many times only *trifoliated*, and ſometimes *winged*; it has a racemoſe *Flower* like the laſt, but ſmaller; I ſhall ſuſpend my Judgment as to what particular *Genus* it may belong to, until I receive it in *Ripe Fruit*. *Deſcription.*

5. Parawootan chedde *Malab.* 5.

Baccifera racemoſa Madraſpatana *Juglandis folio nigris maculis elegantèr aſperſis.* *Names.*

Its *Berries* grow in *Cluſters*, are round, black and coronated, no bigger than *Pepper*, each has a large *Kernel* and but little *Pulp*, which taſts not unpleaſant; its *Deſcription.*

Leaves grow oppoſite and are remarkably ſprinkled with black Specks.

6. 6. Neer Mulle *Malab.*

Names. *Adhatoda* Malabarica *Spinoſa Echii folio.*

The *Hortus Malabaricus* firſt gave us the *Figure* and *Deſcription* of this ſtrange *Diuretick Plant*, in the 2d. Vol. Tab. 45. p. 87. under the *Malabar Name* of *Babel Schulli*, ſince which Dr. *Plukenet* hath *figured* it in his *Phyt.* Tab. 133. Fig. 4. ſtiling it *Anchuſa anguſti*-folia verticillis longis aculeis armata è *Maderaſpatan* & Alm. Bot. 30.

I ſhall omit the *Deſcription* of it here, becauſe that moſt worthy Botaniſt Mr. *John Ray*, in his *Hiſtor. Plant.* p. 1731. hath given it from the *Hortus Malab.* under the Denomination of *Geniſta ſpinoſa* Indica *verticillata flore purpureo cæruleo ſeu Spartium ſpinoſum ſiliquâ geminatâ.*

Since you tell me, Sir, it is a great *Dieuretick*, and that you have ſeen *this* and *round Pepper* boyl'd in Water *Vertues.* and drank Morning and Night cure the *Aſcites* in a *Portugueſe* Woman of 55 Years of Age; I hope it may not be amiſs to tell you what *Vertues* the *Hortus Malabar.* aſcribes to it, *viz.*

That a *Decoction* of it provokes ſuppreſſed *Urine*, and abates the *Swelling* of the *Belly* in *Hydropical* Perſons, and being taken with the *Oyl* of the *Ficus Inferni* (by which I ſuppoſe is meant the *Ricinus Americanus* or *Palma Chriſti*) it cures the *Dropſy* as aforeſaid, and breaks the *Stone*; the ſame externally applied diſſolves *Buboes*. The *Leaves* alſo *boyl'd* and *pickled*, being eaten are *Diuretick.*

Place. The *Hortus Malab.* alſo confirms what you rightly obſerve, that this Plant grows in watry Places, and I am of the Opinion that the *Malabar* Syllable *Neer*, with you, ſignifies *Aquatick*, as I find *Nir* does in the *Hortus Malab.*

7. 7. Nella Walle *Malab.* Cara Veela *Hort. Mal.* V. 9. Tab. 24. p. 43. Veela & Tiloni *Bram.* 6.

Names. *Five leaved Mock-Muſtard.*

Sina-

Sinapiſtrum *Indicum* pentaphyllum flore carneo minus non ſpinoſum *Herm.* Hort. Lugd. Bat.

Although the *Hort. Malab.* does not give us this as a Plant certainly deſcribed by former Authors, yet I find it has been known ever ſince *Proſper Alpinus* his time, which is now ſomewhat more than 80 Years ago, he dying *An. Dom.* 1616. *Antiquity.*

For the ſeveral *Synonyms* of this *Plant* I refer you to Dr. *Sloane*'s elaborate Catalogue of *Jamaica Plants*, p.80. only ſubjoining this one to it, which Dr. *Plukenet*, in his *curious* as well as *copious* Almageſtum Botanicum, p.280. has ſince added, *viz.* Papaver corniculatum acre quinquefolium Ægyptiacum minus flore carneo non ſpinoſum. *Synonyms.*

See a *Deſcription* of it in *Raii Hiſt. Plant.* 859. *Deſcription.*

The *whole Plant* bruiſed and mixt with the *Juice* of *Raca palam*, takes away *Tettars* by waſhing with it; *boyl'd* in *Oyl* it cures all *Cutaneous Diſeaſes*, particularly the *Leproſy*. The reſt of its *Vertues* are the ſame with the *Aria veela*, H. Mal. V. 9. Tab. 23. p. 41. which in a little time we ſhall have an Occaſion to mention. *Vertues.*

8. Neerchomboo *Malab.* 8.

I cannot at preſent diſtinguiſh this to be in any thing different from our *Common Typha* or *Cats-tail.* An *Engliſh* Plant.

Nevertheleſs, I am very well pleaſed to ſee an *Engliſh Plant* an Inhabitant of ſo remote a Part.

9. Vellacaungerree *Malab.* 9.

Mr. *Richard Sambach*, an ingenious *Surgeon* now living at *Worceſter*, a Perſon whom you formerly knew, was the firſt who brought me this Plant from the *Eaſt Indies* which, with many others, I communicated to that moſt accurate Botaniſt, Dr. *Plukenet*, who has figured it in his *Phytogr.* Tab. 120. Fig. 5. and calls it, *Ricinus Altheæ folio molli & incano* Maderaſpatanus & *Alm. Bot.* 321. *Name.*

The

The *Hortus Malab.* had alſo *figured* and *deſcribed* it before in the *2d. Vol.* Tab. 39. p. 73. under the *Malabar Name of* Schorigenam, and by the *Bram.* Pitta Gaſurculi, erroneouſly reckoning it amongſt the *Nettles*, which induced that worthy Perſon, Mr. *Ray*, in his *Hiſt. Plant.* p. 160. to deſcribe it under that *Tribe*; but it being a *Tricoccon*, is therefore truly, as above, placed amongſt the *Ricini*.

Vertues. The *Hort. Malab.* aſſerts that *Rings* made of the *Root* of this Plant and wore on the *Toes*, cures *Fevers* ariſing from *Phlegm*, and that a *Decoction* of it provokes *Urine*; the *Juice* of it drank in *Cows Milk* with *Sugar* cures the *Itch* and a *Fever* (as the Author terms it) in the *Bones*; the *Wood* with the *Berries* bruiſed and applyed, cures ſuch as are wounded with the *Sting-Raye*.

10. 10. Shevanar weamboo *Malab.*

Names. *Anil* Maderaſpatana *foliis minimis confertis.*

This ſeems very well to agree with the *Manelli* Hort. Malab. V. 9. Tab. 37. p. 69. which ſays, the Flowers are of a beautiful red, which I want to be truly informed of, the Specimen you ſent having Pods only.

11. 11. Marrellumetee *Malab.*

A. *The Leſſer Burdock* or *Xanthium.*

Names. Xanthium ſive (Lappa vel) Bardana minor Park. 1223. fig. bonâ. 1. B. Vol. 3. Lib. 33. p. 572. Fig. Chabr. Ic. 514. Lappa minor Xanthium Dioſcorid C B. 198. Phyt. 373. Bardana minor Ger. 664. id. emac. 809. Fig. Ray Hiſt. Plant. 165. Synopſ. 129. & edit. 2. p.

This is a Native of *England*, yet found but in few Places, tho' pretty common in *France*, *Spain*, and *Italy*. I have lately received it from the Iſland of *Coos* collected there by my induſtrious Friend, Mr. *Sam. Daniel*, *Surgeon*; but you are the firſt that ever ſent it me from the *Eaſt Indies*.

It's

It's of a different *Genus* from our *Bardana* or *greater Burdock*, and reſembles it only in its hamated Spines, this being a *Capſule* or *Husk* about the Bigneſs of a St. *Lucar* (or *Luke*) *Olive*, wherein are two *Cells* or *Partitions*, each containing one oval flattiſh *Kernel*, with a blackiſh Film or Skin.

12. Carennucheel *Malab.* by the *Engliſh* at *Fort St. George*, *Black Agnus Caſtus*. 12.

Adhatoda *Madraſpatana* Hydropiperis folio. *Names.*

This Plant in *Leaf* and *Flower* very much reſembles the *Vada Codi* of the *Hort. Malab.* Vol. 9. Tab. 42. p. 79.

If you pleaſe to ſend it me in *Seed* I can better judge of it.

13. Varamullee *Malab.* Coletta Veetla *Hort. Malab.* Vol. 9. Tab. 41. p. 77. Gontua *Bram.* Kathukarohiti *Zeyloneſibus*. Contaſere *Surratenſibus*. 13. *Names.*

Adhatoda *Malabarica* tetracantha. *Synonims.*

Lycium *Indicum* Spinis quaternis ad ſingulorum foliorum ortum *Parad. Bat. Prodr.* Eryngium *Zeylanicum* febrifugum floribus luteis D. *Herman* not. MSS. ad *Herbarium ſuum Vivum*. Melampyro cognata *Maderaſpatana*, ſpinis horridis *Pluk.* Tab. 119. Fig. 5. & *Alm. Bot.* 345.

It grows three or 4 Foot *high* in *Sandy* and *Watry Places*. Hort. Malab. *Place.*

It *Flowers* and *Seeds* in *January* and *February*. *Time.*

The *Juice* cures *Thruſhes* and the Swelling of the *Bowels* by Wind, the *Natives* chew the *Leaves* of this inſtead of the *Betle*. H. M. and it colours the *Teeth* black, as Mr. *Benjamin Mewſe*, who brought it me from *Suratt*, informs me. *Vertue, and Uſe.*

Moochee

14. 14. Mocchee chedee *Malab.*

Its Kind. This is a ſort of *Phaſeolus* or *Kidney-Bean*, of which Species you have many in your Parts, it is very difficult to diſtinguiſh them but by their ripe Pods or Seed, neither of which the *Samples* you ſent afforded, it may probably be one of thoſe deſcribed in the *8th Volum* of the *Hortus Malab.* but by reaſon of the aforeſaid Deficiencies, I dare not determine it.

15. 15. Corain-cheddee *Malab.*

Name. *Baccifera racemoſa* Madraſpatana *Lauri Ceras foliis, floribus parvis numeroſiſſimis.*

Deſcription. The *Leaves* in Shape, Thickneſs and Magnitude, very much reſemble our *Lawrel*, theſe ſtand on very ſhort or no Foot-ſtalks, and are ſet oppoſite alternately (*i. e.* by Pairs croſs-wiſe) as in our *Mint* and ſeveral other *verticillated Plants*, each ſide of the Stalk from whence the *Leaves* proceed is towards the Flowring part remarkably carinated or furrowed, towards the Extremities of each Branch proceeds the flowring part.

The *Flowers* are very many and ſmall, grow in large Tufts or Branches admitting of ſeveral Ramifications, theſe are ſucceeded by a ſmall *Coronated Fruit*, in Shape, Colour and Magnitude very much reſembling the *Pimenta*, *All-Spice*, or *Jamaica-Pepper*, its inſide alſo very like it.

Its Affinity. It much reſembles the *Appel* Hort. Malab. Vol. 1. Tab. 53. p. 99. as to its *Fruit* and *Form of Growing*, but our *Leaves* are larger and more oblong.

16. 16. Serrufaulee *Malab.*

Name. *Periploca* Madraſpatana *Smilacis folio.*

Deſcription. The *Leaves* are like thoſe of *our great white Bindweed*, but not quite ſo large, they grow by Pairs at certain Joints, being generally accompanied with two ſmaller Leaves on very ſhort Footſtalks, from theſe Joints come forth

forth ſmall *Cluſters* of little *Flowers*, like thoſe of *Aſclepias*; each of theſe are ſucceeded by a double thin *Podd*, which is about two Inches and a half long, and one where thickeſt. The *Seed* lies in that part next the Footſtalks, they are roundiſh, flat, and membranaceous, of a brown Colour, and hem'd about with a ruſty colour'd Liſt or Selvedge; the *Silky Down*, which ſticks to the Crown of the Seed is very white, and ſoft as Sattin; each Plume is $1\frac{1}{4}$ Inch long.

It ſomewhat reſembles the *Watta Kakacodi*, H. Mal. V. 9. Tab. 15. p. 25. in its ſcandent Quality, but our *Leaves* are more taper, and the *Flowers* come not from one Bottom, and ſeem ſomewhat ſmaller. *Compariſon.*

17. Calovee *Malab.* 17.

Convolvulus Madraſpatanus *flore auriculato, calycibus majoribus.* *Names.*

This is a trailing *Bindweed*, its *Leaves* ſtand on half Inch Footſtalks, the largeſt of them are ſomewhat more than an Inch over, and near two long, each ending in a ſharp Point; at the Boſom of each Leaf, which ſtands at certain Diſtances, comes one ſmall ſingle *Flower*, very rarely two; theſe are ſucceeded by a *round Capſule*, ending in a long Thread ſomewhat Hoary, about the bigneſs of a *Pea*, theſe are ſurrounded with five Leaves, two larger, and between theſe, three ſmaller; a little below this Calyx are two ſmall Leaves, for the generality ſet oppoſite; in each *Husk* are commonly found four ſmooth browniſh *triangular Seeds* about the bigneſs of *Musk-Seed.* *Deſcription.*

This comes next of Kin to the *Viſtnu-Ilandi*, H. Mal. V. 11. Tab. 64. p. 131. but differs thus; theſe Leaves are ſharper pointed, and larger, and ſtand on Footſtalks, the other the contrary; and from that of *Bocco* in having much larger Husks, *&c.* *Its Affinity.*

18. 18. Adaca-manjen, *H. Mal.* 10. Tab. 43. p. 85. Mundi *Bram.*

Synonims. Planta Indica alato caule, folio crenato piloſo & viſcoſo flore glomerato purpureo Com. in H. Mal. Scabioſa major criſpatis foliis alato caule Malabarienſis Alm. Bot. (which differs not from the Scabioſa Indica major caule & pediculis folioſis of Dr. *Plukenet*, in his *Phytographia*, Tab. 312. Fig 6. and is the ſame with his Scab. minor alato caule Maderaſpatenſis Alm. Bot. 335. & Scabioſæ capitulo Chryſanthemi Myconii foliis alato caule Maderaſpatenſis in his Phyt. Tab. 108. Fig. 7. this laſt being the Specimen of a younger Plant, and the ſecond one of the ſame grown to more Maturity, as is very apparent in Samples of both which I have by me.

Vertues. Of the *Leaves* and *Heads* of this Plant is made a Decoction good in Faintings occaſion'd by Wind, as alſo Pains in the Bowels, but more eſpecially if you add Cumin-Seed powdered, and rub the part grieved therewith. With the Powder of it and Oyl they make an Oyntment good againſt the Itch, and all cutaneous Diſeaſes. Being mixt with Honey, it cures a Cough. Of the Root dried they make a Stomachick Powder; good alſo for the Gripes in the Bowels. The Bark of it being bruiſed and mixt with Whey cures the Piles. The Inhabitants put it in their Drink, *H. M.* as we do *Wormwood.*

19. *Names.* and *Synonyms.* Carpa Cacuanna *Mal.* Scanga cuſpi altera ſpecies H. Mal. V. 8. p. 70. Cata roda Zeyl. Creuck Javan. Flos Clitoridis Ternatenſibus Breyn. Cent. p. 76. Cap. 31. Fig. .

Phaſeolus Indicus cæruleus Glycyrrhizæ foliis alatis, fl. amplo clitorio Alm. Bot. 294.

The Blew Clitorian Flower.

Vertues. The Juice drank with the Oyl of *Schirgelim* (which I take to be the *Portugueſe* Word for the *Seſamum* of the Ancients)

Ancients) provokes Vomiting. The Root bruiſed and drank in warm Water purges gently, which Virtues confirm what you relate as to its Emetick and Cathartick Quality: But the Root, as well as Genus of this and the next vaſtly differs from the Ipecacuanah of Piſo, p. 231. ed. 2. *N. B.*

20. Vela cacuanha Mal. Schanga-cuſpi H. Mal. V. 8. Tab. 38. p. 69. Gocarni Bram. Fabas de Brhamanne Luſit. Smalt-cruid Belgis. 20.

Phaſeolus alatus *Ternatenſium* floribus albis *Alm. Bot.* 294.

The white Clitorian Flower.

This differs from the laſt only in the Colour of its Flower.

21. Pea-tumba Medde *Malab.* Tumba H. Mal. V. 10. Tab. 91. p. 181. & Bram. 21.

Nepeta Indica Sideritidis folio, floribus ſpicatis *Com.* in *H. M.* Cardiaca minor annua Americana flore Argenteo, ſeu Leonurus Americana alba folio Sideritidis longiore Phyt. Tab. 80. Fig. 7. *Synonyms.*

The narrow leav'd white Malabar *Leonurus.*

It Flowers all the Year, and the bottom of each Flower contains a Hony-like Liquor, *H. Mal.* *Time.*

Boyl'd in *Oyl* it cures the *Itch*, the *Juice* kills *Worms* in Ulcers, and being mixt with Lime it heals the biting of a *Mad Dog*. Taken up the Noſe it eaſes the Head-ach. A Decoction of the Root drank cures the Leproſy. The Root or Leaves chewed and breathed on the Eyes takes away Films. *H. Mal.* *Vertue.*

22. Ponangcunne laccaree *Mal.* 22.

Perexil Madraſpatana foliis oppoſitis anguſtioribus Polygoni.

Georgius Marcgravius, one of the firſt Obſervers of this Tribe of Plants tells us, the *Portugueſe* call'd it *Perexil*, I have therefore choſe rather to diſtinguiſh it by

this Particular ſhort Name, than to reduce it to a longer, *viz. Amarantho affinis Azoides, &c.* to the cloſe of which Species it may be nevertheleſs added, with ſuch others as may not come ſo adaptly amongſt the *Amaranths* themſelves.

I do not give you this as wholly new, there being one or two very like it, that I have received from the *Weſt-Indies*, which, after I have more ſtrictly examined, I ſhall farther inform you of.

It ſeems to grow erect, whether ſo or procumbent pray obſerve.

23. Neer kille gelippe *Mal.* Wellia tandale cotti *H. Mal.* V. 9. Tab. 28. p. 51. Gagaro *Bram.*

Geniſta *Malabarica* pentaphylloides fl. amplo aureo flaveſcente ſiliquis bullatis *Com.* in *H. Mal.* Crotolaria pentaphylloides *Madraſpatana* floribus luteis *Alm. Bot.*

Finger leaved Malabar *Rattle-broom.*

Deſcription. It grows near three Foot high, the *Leaves* are diſpoſed like thoſe of *our Garden Lupines*, but never more than five from one center, they are Green above and Pale below; theſe ſtand on an Inch Footſtalk, more or leſs, one ſide of which is furrow'd. The Stalk is round and carinated, at the Top of which its Golden Yellow *Flowers* grow in a *Spike* on ſhort Footſtalks, which are ſucceeded by a turgid bladder-like Pod, which terminates in a long Style.

Vertues. The *Hort. Malab.* aſcribes the ſame *Vertues* to the *Seed* of this Kind as he does to the *Tandale cotti* V. 9. Tab. 25. p. 45. which is of the ſame Species, *viz.* That they make a Bath of the Decoction good in *Fevers*, but moſt eſpecially in tedious *Tertian Agues.*

24. *Names.* 24. Punga maraum *Mal.* Pongam ſeu Minari *H. Mal.* V. 6. Tab. 3. p. 5. Caranſi *Bram.* Favas de chapa *Luſit.* Mans bonen *Belg.*

Criſta

Crista Pavonis monospermos 3. *seu Arbor Vespertilionis maxima* Indica, *Juglandis folio majore, floribus spicatis albicantibus odoratis, siliquâ nonnihil falcatâ, semine renali latissimo* Breyn. Prodr. 2. *Phaseolis accedens* Malabarica *alatis foliis glabris monospermos siliquâ latiore brevi* Alm. Bot. 294. & *Pluk.* Tab. 310. Fig. 3. *Synonyms.*

This Tree *grows* in Rocky Mountainous Places. *Place.*

It bears from 15 to 50 Years old. *Duration.*

It's ever Green, bearing *Flowers* and *Pods* from *April* to *January*. *Time.*

The *Wood* serves for *Firing*. A *Bath* made of the *Leaves* eases *Gouty* and *Windy Pains*; and the *Fume* of it allays *Fevers*. Its *Juice* timely taken cures the Bites of venemous Serpents, *H. Mal.* *Use.* and *Vertue.*

25. Puccapoonda *Mal.* 25.

Samolus *Madraspatana* Gram. Leucanthemi foliis. an *Alsine holostea glabra seu Gramen Leucanthemum* Indiæ Orientalis *Anagallidis Aq.* 4 *Lob. foliis angustioribus.* Phyt. *Tab.* 130. Fig. 3. & Alm. Bot. 21. *Name.*

Of all the Plants in the *Hort. Malab.* this most nearly resembles the *Parpadagam* figured in *Vol.* 10. *Tab.* 35. p. 69. *Its Affinity.*

The Stalk of this *Herb* from a small Fibrous *Woody Root* subdivides it self into very many smaller Branches, at each Joynt comes forth two long smooth and narrow *Leaves*, having sometimes, but very rarely another pair; these are like those of *our lesser Stitchwort*; from the setting on of these *Leaves* comes one or two, rarely more, *round capsules* not bigger than the Head of a large Pin, each standing on a fine stiff hair-like Footstalk, scarce an Inch long, each *Husk* seems coronated, *i. e.* has four little opposite Leafy Points, between which the Top is ridgd; within are contained many very small *blackish Seed*, which as nicely as I could perceive, were not sepa- *Description.*

rated

rated by any Partition, tho' the *Capſule* ſeems externally to be *ſulcated.*

26. 26. Neer Ureevee *Mal.*

Lyſimachia non pappoſa humilis Maderaſpatana *Clinopodii Virginiani lutei foliis fructu Carophylloide parvo*, Pluk. *Tab.* 203. Fig. 5. & *Alm. Bot.* 236. an *Carambu* Hort. Malab. *Vol.* 2. *Tab.* 49. p. 95.

27. 27. Perrepan Chedde *Mal.* Tsjeru-Tsjurel *H. Mal.* V. 12. *Tab.* 64. p. 121. vulgo *Rottang*, and by us *Rattan.*

Names and Synonyms. *Rottang* Malabaricus *minor. Arundo Rotang dicta Piſo* Mantiſs. Aromat. 188. Fig. *Ray H.Pl.* 1316. A. *Nucifera* Rotang *dicta, fructu ſpadicei coloris ſtriis purpureis venuſtè teſſulato* Alm. Bot. *Phœnico-Scorpiuros ſeu Helitropium Palmites ſpinoſum, Polygonati anguſtis foliis* Madraſpatana, *Pluk. Tab.* 106. Fig. 1, & 2. & Alm. Bot. 276. *Fructus ſquammoſus orbiculatus minor Avellanæ magnitudine* C B. 510. *F. exilis Cannæ de Bengalâ creditus* Clus exot.p.24. Fig. *Fr. Cannæ de Bengalâ* I B. V. 1. l. 3. p. 400. an *Arundo Indica verſicolor. flexilis*, CB. 18. IB. V. 2. l. 18. p. 489. & Raii H. Pl. 1277.

The leſſer Rattan or Cane-chair Reed.

Deſcription. The middle Rib of theſe *Leaves*, as well as Edges, are finely beſet with very ſmall hairy *Thorns*, which is neither expreſt in the *Hortus Malab.* or Dr. *Plukenet*'s *Figure*, which laſt otherwiſe very well reſembles this Plant, particularly the tendency or peculiar coyling of its *Flowers*, which turn inwards like thoſe of *Tournſole* or *our Mouſear Scorpion Graſs.* The *Fruit* alſo holds the ſame Diſpoſition. Each *Racema* and its ſub-divided *Spikes* of *Flowers* and *Fruit* are incompaſs'd below with a *membranaceous Vagina* or *Sheath*, conſpicuous in both, but more obvious when in *Flower.*

The

The Fruit of this Reed is eaten by the Inhabitants and with the Canes ſplit they make their Net-like Seats, as we do here our Cane-Chairs and Stools of the ſame. They apply the *Roots* roaſted to the Head for the Pain thereof, *H. Mal.* *Uſe and Vertue.*

28. Collarunan coodee *Mal.* 28.

Soldanella Madraſpatana major.

This ſeems to agree in every point with the *Bel Adambu Walli.* H. Mal. V. 11. Tab. 58. p. 119. except its having fibrous Roots at every Joynt or Leaf, which this is void of.

29. Ardanapolle *Malab.* 29.

This is an *Ariſtolochia* or *Birth-wort*, and has the Face of our common Kinds, but whether *Round* or *Long* its *Root* muſt determine.

29. a. Carentulee *Mal.* 29. a.

Mentha Madraſpatana *cauliculis rubentibus hirſutis.* an *Ocimum* Madraſpatanum *fruteſcens gratiſſimi odoris flore parvo cauliculis villoſis* Pluk. Tab. 208. Fig. 4? *Name.*

This ſeems to be that Variety of *Solado tirtava* Hort. Malab. V. 10. p. 173. whoſe *Stalks*, the Author ſays, are of a reddiſh brown, and the *Leaves* of a darker green, which with the aforegoing Deſcription agrees very well with this Plant. *Affinity.*

30. Toura *Mal.* Thora Paerou *Hort. Mal.* Vol. 6. Tab. 13. p. 23. Thori *Brach* Tangaraca *Luſit.* Quitſierii at *Indoſtan*; and by the *Dutch* there, Kayan ſeu Katsjan *Zeyl.* Lak Goetum *Chinenſibus*; at *Barbadoes* and *Jamaica* it's call'd, *The Pidgeon Pea.* 30. *Names.*

Laburnum humilius ſiliqua inter grana & grana juncta ſemine eſculento Cat. Plant. Jam. 139. *to whoſe numerous* Synonyms *I thither refer you, only adding this omitted one*, viz. *Arbor Fabifera trifolia Salviæ foliis, floribus luteis elegantiſſimis* Hort. Boſian. *Synonyms.*

I

Placc. I have not only received this Plant from *Barbadoes* and *Jamaica*, but alſo from ſeveral parts of *Africa* as well as *Aſia*.

Vertues. A *Drink* made of the *Leaves* ſtops the overflowing of the *Hemorhoids*; the ſame powdered with *Pepper* cleanſes the *Gums* and cures the *Toothach*. A *Fomentation* of the *Seeds* with a little *Rice* made into a *Linament* with *Butter*, takes away Wearineſs and Pains in the Joynts. They make a Drink alſo of the aforeſaid very good in the *Small Pox*. H. M.

31. 31. Velluppelle *Malab.*

Names. *Euphraſia pratenſis Satureiæ foliis ſcabris* e Maderaſpatan. *Pluk.* Tab. 177. Fig. 6. & *Alm. Bot.*

Deſcription. It grows many times more than two Spans high, the *Root* woody and ſtiff, tho' very ſmall and threddy, its *Leaves* like *Roſemary*, but ſomewhat narrower, and ſometimes longer; from the Boſom of every Leaf comes forth a rough carinated footleſs *Calyx*, in which ſtands a *Flower* ſomewhat larger than the *common Eyebright*, with a long Tube or Neck which ſtands above the *Calyx*, theſe are ſucceeded by a ſmall Husk which opens when ripe, and ſhews its Interſepimentum or Partition. This *Plant* is commonly brancht, and runs up into very ſlender long Spikes.

Time. It *Flowers* and *Seeds* in *December* and *January*.

32. 32. Narreepangul coodee *Mal.*

Names. *Balſamina* Madraſpatana *fructu parvo anguloſo perbrevi pediculo affixa.*

Deſcription. The *Leaves* are rough, have generally five Lobes, the two lower not ſo conſpicuous, and ſometimes wanting, the full grown Leaves ſtand on a prickliſh or rough *Foot-ſtalk* more than an Inch long, whoſe *Serræ* end in Spines, againſt which grows a curl'd *Tendrel*, which is guarded with a *Lobe* or *Ear*, whoſe Edges is ſurrounded with Hairs like thoſe on the Leaves of *Sundew* at each *Joynt* between

between the *Leaf* and *Tendrel* comes the *Fruit* which is brown, ſmooth, oblong, and angular about the bigneſs of a *Barberry* or ſomewhat larger, it ſtands on a very ſhort Footſtalk, and has its *Corona* againſt it in the middle of the *Fruit*, and not at the end, which is very remarkable.

33. Podoodalle *Mal.* 33.

An *Verbena nodiflora* C B. 269? Prod. 125. deſc. & fig. opt. & Phyt. 524. deſc?

This Plant very well agrees with the *Figure* and *Deſcription* of this *Author*, who was the firſt that deſcribed it.

34. Rutraſhacaudumba *Mal.* 34.

Jaca Madraſpatana *fructu Sparganii.* *Name.*

This may be the *Jaca minor ſylveſtris* Malabarica *Comel* in *Hort. Malab.* V. 4. *Tab.* 35. p. 73. but I have not as yet obſerved more than a ſingle *Fruit* from one Place, ſet on longer or ſhorter Footſtalks and branched, whereas theirs is *figured* in *Cluſters* (like our *Cheſtnuts*) and without Pedicles; the *Leaves* are ſomewhat broader and rounder, otherwiſe they have much the ſame Face and Texture with the *true Jaca*, as I have nicely obſerved by comparing it with a *Specimen* which that moſt *Celebrated Botaniſt*, *JACOBUS BREYNIUS*, ſent me a little before his Death. *Affinity and Deſcription.*

The *Fruit* of this is globular, very like the Burrs of *Sparganium*, but none that I have yet ſeen are quite ſo big, they are made up of ſmall wart-like Tubercles, each rugoſe, like a *Sweet Fennel-Seed*, the *Fruit* cut open very much reſembles that, ſo repreſented in the *Hortus Malab.*

35. 35. Caut Morunga *Mal.*

OR

Wild Bezoar Tree.

Name.

Anil Madraſpatana *trifoliata, ſiliquis carinatis hirtis.*

Deſcription. This *Plant* in all the Samples I have yet obſerved, has only three Leaves, from the ſetting on of which comes forth ſmall *Spikes* of little *Flowers*, theſe are ſucceeded by as many Quadrangular, carinated, ſhort-hair'd ſtiff *Pods* each an Inch long.

36. 36. Nella mullee *Mal.* Pee-Tumba *H. Mal.* V. 9. Tab. 46. p. 87. Butumbo *Brach.* Kawatuwa, *Zeyl.*

Names.

Synonyms. *Euphraſiæ affinis* Indica *Echioides* H. Leyd. *app. deſcript. & Fig.* 663. *Gratiolæ affinis Echioides Zeylanica major* Breyn. Pr. 2. *Bugloſſum Echioides Indicum Convolvuli cærulei minoris folio* Ephemer. German. *Ann.* 4. & 5. *Obſerv.* 139. p. . Fig. & deſc. *Lyſimachiæ* Virginianæ *accedens planta* Com. in *H. Mal.*

References. For a *Deſcription* of this Plant I refer you to the *Hort. Malab.* and Dr. *Herman's Leyden Catalogue*, in both which they are accurately performed, (the laſt is tranſcribed by Mr. *Ray* in the Appendix to his *Hiſt Plant.* p. 1885) but the *Figures* of neither ſhews the Hoarineſs, which is very apparent in all parts of the Plant as my *Specimens* as well as the aforeſaid *Deſcriptions* make very plainly appear.

Vertues. The *Leaves* taken inwardly is an Antidote againſt the biting of a *Mad Dog*, and the *Juice* a Specifick in *Agues* H. M.

37. 37. Neer Caudumba.

Names. *Pentaphlora* Madraſpatana *arboreſcens Benzoini foliis.* I do not find any Plant in all the *twelve Volumes* of the *Hortus Malabaricus*, that this more nearly reſembles than

than the *Modagam*, Vol. 4. Tab. 58. p. 119. but I dare not affirm it to be the ſame, until I am better informed of the *Colour* of its *Flower*, *Shape* of its *Fruit*, *&c.*

Since I have mention'd the *twelve Volumes* of the *Hort. Malab.* which is indeed a very *curious Work*, I cannot omit telling you (it not being there taken notice of) that I am lately given to underſtand, that Dr. *Wilhelmus Ten Rhyne* a moſt ingenious *Phyſitian* and *Botaniſt* now living at *Jacatra* in *Batavia*, had a large ſhare in compoſing that moſt *Noble Herbal*, as may be ſeen by Letters under his own Hand which he wrote to a *Learned Phyſician* of my Acquaintance, who was ſo kind to inform me of it. *N.B.*

38. Combee chedde *Mal.* 38.

Pentaphlora Madraſpatana *Nerii flore tubo longiſſimo.*

Its *Leaves* in Shape and Stiffneſs are like thoſe of *Lawrel*, at certain diſtances from the middle, the Veins are very conſpicuous on both ſides. The *Flowers* ſeem to reſemble the *Oleander* or *Roſe-Bay*, its long Neck or Tube in ſome of theſe are near two Inches long, being ſet in a ſmall *pentapetaloſe calyx* not unlike thoſe of *Archangels*, *&c.* this makes the *Crown* of the *Fruit* which is an oval Shell about the Bigneſs and Shape of a large *Spaniſh* Olive; internally it has three Selvedges to which the Pulp adheres, in which is contained a great many *ſmall flattiſh Seed.*

39. Neer Culuttee *Mal.* Culi Tamara *H. Mal.* V. 11. *Tab.* 45. p. 93. 39.

Sagitta Indica *major*, *folio obtuſo*, *floribus minoribus albicantibus*. Com. in H. Mal. p. 94. *Sagittariæ foliis planta*, *glomerato fructu*, *monopyrene*, *Coriandri ferè figurâ* Pluk. Tab. 220. Fig. 7. & Alm. Bot. *Synonyms.*

Comparative Difference. The *Leaves* are like our *Arrow head*, but the *Spear* broader and blunter, and the *Barbs* longer, the *Flowers* tripetaloſe, but it differs moſt in the *Fruit*, which grows in a Cluſter-like a *Mulberry*, but more ſeparate, and each as big as a *Curran*, but by lying together are compreſt.

40. Woota chedde *Mal.*

Ricinoides arboreſcens Madraſpatana *Cotini foliis.*

Theſe *Leaves* grow alternately on ¹ Inch Footſtalks, the largeſt of them are about one Inch and an half broad, and two and an half long. Its *Fruit* very like a *Bayberry*, but ſomewhat bigger, its outer Skin being dry is brittle, thin, and ſhining as if varniſht, brown and ſomewhat wrinkled like the *Piſtachioes*, under which is a Shell alſo like them, but breaks into two or commonly three parts, ſeparated with Partitions, each of which being ſplit diſcovers one *Seed* much leſs than its Cavity, not unlike thoſe of *Caſſia fiſtula*, but ſomewhat leſs and rounder, and pointed at one end.

41. 41. Shega pu coondamonee *Mal.* Konni *H. Mal.* V. 8. Tab. 39. p. 71. Fruita Contſii *Luſit.* Ronde Weegbonen *Belg.*

Names.

Abrus minor Indiæ Orientalis *ſiliquis majoribus.*

I chuſe to diſtinguiſh it only by this Name at preſent, until I have more leiſure to ſeparate the *American Synonyms* from it, wherein I find it ſomewhat differs, particularly in its *Podds* and Form of growing, which in this are larger though fewer, and have more *Seed* in them, *viz.* ſeldom leſs than five or ſix, and the *American* rarely or never more than three.

Vertues. The *Leaves* bruiſed and boyl'd in Water or Oyl with *Calamus Aromaticus*, alleviates ſuch gnawing Pains as ariſe from ſharp corroſive phlegmatick Humours. The *Powder* alſo taken with *Sugar* ſtops *Catarrhs.* The *Juice* takes away all cold *Pains* in the *Joynts*; the ſame being made

made into a *Liniment* with *long Pepper*, *Ginger*, *Milk* and *Sergelim-Oyl* diſſolves all thick and tough Humours. The *Root* Powder'd with *Cummin* and taken in Water, corrects and cuts tough Phleagm; the *ſame* with the *Fruit* and *Coco-Nut-Milk* cures the Piles. *H. Mal.*

42. Caut Mandaree *Mal.* 42.

There are four ſorts of this particular leaved Tree, deſcribed in the firſt Volume of the *Hort. Malab.* Tab. 32, &c. the main Difference conſiſts in the Shape and Colour of their *Flowers*, and Form of their full grown *Podds*, and until we have them in this Perfection, it will be difficult rightly to diſtinguiſh them.

43. Curuta chedde *Mal. Mal.* an *Naregam* Hort. Malab. *Vol.* 4. *Tab.* 12. p. 27? 43.

Limo Madraſpatanus *apicibus foliorum ferè ſinuatis, fructu cuſpidato.* Names.

Theſe *Leaves* ſtand on very ſhort *Footſtalks*, not above $\frac{1}{4}$ of an inch long, the largeſt about an Inch *broad*, and not two *long*, taper at each end; but what is moſt remarkable in them is, they commonly terminate ſomewhat bifid, or as it were ſlit at the Point; they are perforated, and have the Texture of *Lemmon Leaves*; they altogether want that cordated Appendix next the Footſtalk; its Thorns are woody and come from the boſom of the *Leaves*. Its *Flowers* grow in ſmall *Cluſters*, and ſeem to agree very well with the *Figure* and *Deſcription* of the *Mal Naregam* H. Mal. V. 4. Tab. 12. p. 27. but the *Fruit* doth ſomewhat vary; it's about as big as a *Cherry*, and ends in a Point, has ſome Cortical Spots and ſeems porous as the *Lemmons*; its inſide is divided into four Cells, in each of which I generally find one *Kernel*. Deſcription.

44. This

44. 44. This has no Name in *Malabar*, in *Engliſh* PARSLY.

Under this *Denomination* and *Number* I find two different *Umbelliferous Plants*, I preſume theſe were cultivated in *Gardens*; for I have not yet ſeen any of this Species growing wild from your Parts, neither is there in all the *Hortus Malab.* one of this *Genus* there deſcribed.

45. 45. Yelavan maraum *Mal.*

Names. Goſſipium arboreum maximum ſpinoſum, folio digitato, lanâ ſericeâ griſeâ *Cat. Pl. Jam.* 159.

Dr. *Sloane*, that moſt *learned* and *accurate Botaniſt* (to whoſe *Catalogue* I refer you for the many other *Synonyms* hereto belonging) obſerves that the Tunck of this Tree loſes it Thorns as it grows old, and therefore ſuppoſes the ſmooth and thorny to be the ſame, whereas the *Hortus Malab.* Vol. 3. Tab. 49, &c. has taken no ſmall Pains to make them diſtinct.

46. 46. Coole cheddee *Mal.*

Phaſeolus Madraſpatanus pubeſcens minor, ſiliquis recurvis. an *P. Madraſp.* Laplab *effigie flore parvo ochroleuco* Pluk. *Tab.* 213. Fig. 4? & *Alm. Bot.* 291?

The *Leaves* very well reſembles Dr. *Plukenet's Figure*; the whole Plant is ſomewhat hoary but particularly the *Stalks*; the *Flowers* ſeem yellowiſh, the ripe *Podds* turn a little backward and end in a Style or thread; they are of a Tawny or Phyllamort Colour, as are the *Seeds* which are flatiſh, ſmall and ſeem ſomewhat marbled. Each Pod has five or ſix *Seeds* with Depreſſions between each.

Thus

Thus, Sir, I have given you my Sentiments of this your *Unanercoonda Collection*, and if herein I can be farther Serviceable to you, be pleaſed freely to Command,

WORTHY SIR,

From my Houſe in *Alderſgate-ſtreet*, *LONDON*, *Sept.* 24. 1698.

Your moſt Obliged Friend,

and Humble Servant,

James Petiver.

III.

III. *Part of a Letter from Mr.* Butterfield *from* Paris, Sept. 7. 1698. *to Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians and R. S. concerning Magnetical Sand.*

I Send you a little of that *Black Sand* which in *Italy* they uſe inſtead of Duſt to their Letters; it is found Six Miles from *Genes* near St. *Piere d'araine* on the Sea-Shoar. It hath the Properties of the Loadſtone, and I do believe that it is Loadſtone or Powder of Loadſtone, for it followeth the Loadſtone; it ſticketh to a Knife that is touched with the Loadſtone; it draweth a Magnetick Needle; it doth not ferment with *Aqua Fortis*, as Iron Duſt doth; it doth not ruſt with any Acide that can be put to it; it doth not ſparkle in the Flame of a Candle, as Steel-duſt doth when it is thrown into the ſaid Flame. It is commonly found on the Sea-Shoar after great Storms.

IV. *An Objection to the new Hypotheſis of the Generation of Animals from* Animalcula in Semine Maſculino. *By Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians and Royal Society.*

Exercit. Anat. tert. p. 114.

Amongſt the many Arguments which I have uſed to confute the Opinion of Mr. Leewenhoeck *about the Generation of Animals from innumerable little Animals* in Semine Maſculino, *one I omitted, which is as follows:*

RUrſus quæro, ſi humanum corpus naſcatur ab animalculo è ſemine maſculino unde ſint iſta animalcula genita? & quidem generantur ad plurimos annos; ſcilicet ab adulto viro ad extremam uſq; ſenectutem; certe à coitu peracto longè maxima eorum pars ejicitur; unde nova ſoboles indies ſuccreſcat, neceſſe eſt. An vero hæc animalculorum proles ferè diurna à ſui ſimilibus animalculis generentur, vel ſponte naſcantur? Poſterius te, Leewenhoecke, exiſtimare haud facilè credo, quia tu, ſi quis alius, automata mirificè confutaſti: ſi prius verò putes ipſa etiam illa animalcula, dum in ſemine maſculino ſunt, adulta eſſe ſequetur, quòd generare potes ſunt. At quam abſurdum hoc ſit, tute cogita; ſcilicet eadem animalia bis *adoleſcere*, nempe ſemel in ſemine maſculino, atq; iterum in humano ſtatu atq; conditione.

V. *An Abſtract with ſome Reflections on a new Account of* Eaſt-India *and* Perſia, *in Eight Letters, being Nine Years Travels, begun* 1672. *and finiſhed* 1681, &c. *By* John Fryer *M. D.* Cantabrig. *and Fellow of the Royal Society. Printed for* R. Chiſwel *at the* Roſe *and* Crown *in St.* Paul's *Church-Yard.* 1698.

HOW much the Geography of the preſent Age ſurpaſſes that of the Ancients, is ſufficiently known to all ſuch as have been at the trouble to examine and compare them; and that not only for the Number and Quantity of the Habitable and Inhabited Countries of the World; but for the more exact Limitations and Boundaries of them; and for the more particular Account of the Nature and Products of the Countries themſelves; that is, of the Nature of the Soyl, and of the Animals, Vegetables and Minerals it produceth and yields, and of the Men that inhabit each, their Shape, their Genius, Manners, Cuſtoms, Laws, Governments, Arts, Inventions, Trades and Manufactures, and whatever elſe is of Signficancy to be known concerning them. For this in a great meaſure we are beholding to ſuch Ingenious Spirits as this our Author, who have had the Curioſity not only to travel, view, and inform themſelves in the Places where they are, but alſo the Induſtry to record them in writing, whilſt yet freſh in their Memory, and the good Nature to communicate them in Print for the Uſe of the Publick. Of this Kind we have had of late Years many eminent Inſtances of our own Countrymen, concerning the In-land parts, as Captain

tain *Smith*, Mr. *Herbert*, Mr. *Sands*, Sir *Tho. Row*, Mr. *Gage*, Mr. *Ligon*, Mr. *Willoubby*, Mr. *Ray*, Sir *George Wheeler*, Captain *Knox*, Mr *Dampire*, and divers others, and now laſtly this of the preſent Author, who notwithſtanding ſeveral Writers had been before him, yet few having been in thoſe Parts where he had been, at leaſt had not ſtayed there ſo long as he did, has offered divers Novelties either paſſed over, or not ſo particularly obſerved by them as he has done. His Method of Delivery is not bounded by the narrow Limits of an Hiſtorian, nor looſely Extravagant like Poetick Fiction, but ſuited to Time and Place, ſo as to manifeſt his Diligence in obſerving and collecting, and his Sincerity in compiling what may aſſiſt the next Adventurers, and ſatisfy the preſent Enquirers. He has divided the whole Diſcourſe into Eight Letters, written to a Friend, and dated from ſeveral Parts where he then was. The Firſt gives an Account of his Voyage from *England* till he arrived at *Bombaim*, which was a juſt Year or Twelve Months; taking notice of what occur'd remarkable at Sea, or on the Shoars and Places where he Landed, as at St. *Jago* (which he more particularly deſcribes) as alſo *Johanna*. Then *Mechlapatan* [where he takes occaſion to deſcribe the Kingdom and preſent Eſtate of *Golconda*, and the manner of living of the *Eaſt India* Company's Factors at that Place, the Climate, Soyl, Temper of the Air and Seaſons, the Animals and Vegetables; the Inhabitants, (Moors and Gentues,) their ſeveral Cuſtoms and Natures, their Trades, Employments and Arts, their Language, Writing, Religions, Laws, and Puniſhments, (one of which, though Tragical, is ſomewhat Comical, by a Drink compounded of *Bang* and *Deutro*) their Servants and Beaſts for Service as well as Food; and here he deſcribes more particularly the Elephants]. After this he deſcribes *Fort St. George* and *Maderas*, the Eſtate of

the *Engliſh* there and that of the other Inhabitants; and by the way gives an Account of the *Chinam* or *Betele*; then the City of St. *Thomas* (and a ſort of Chriſtians there) then *Trebletore* (and here takes occaſion to relate ſome Conteſts of our *Engliſh* with the *Dutch*, then at Wars with us) and then proceeds to a Deſcription of the Air and Seaſons, the Monſoons, and Rains, and Storms uſual in thoſe Parts; taking notice of ſtrange colour'd Fiſhes in the Sea, and Tuttecory on the Land, and alſo of the prodigious Ridge of the Mountain *Gates*, extending North and South Nine Hundred Miles, and ſevering the Coaſt of *Coromandel* from that of *Malabar*, and terminated by the Promontory or Cape of *Comorine*; after the paſſing of which he deſcribes the *Malabar* and *Canatick* Coaſt as far as *Bombaim:* Here he relates a ſtrange Phenomenon of a Shole of Pilchards paſſing by, that gave a Light bright enough to read a ſmall Print by it. He takes notice of *Carnapoly* (whence we formerly had Pepper); then of *Cochin*, then *Tanore*, which he more particularly deſcribes; then *Calicut*; then *Phalopatan*, where he took Boat and rowed up the River to *Cutty Cony* (then reſigned to the *Engliſh* where they have a Fort). Being return'd they paſſed Northward, leaving the *Malabar* Coaſt and entring the *Canatick* they Anchored and Landed at *Onor*, from thence they went to *Miria*, where they laded Pepper, Saltpeter and Betele-Nuts. Then paſſed *Carwar*, *Goa*, *Rajapore* and laſtly arrived at *Bombaim*, lying in 18°. 40'. whoſe Bay he Deſcribes and thence Dates this Firſt Letter.

In his Second Letter he gives a more particular Account of the Iſland of *Bombay*, one of the Iſlands of *Salſet* lying in the middle between *Goa* and *Surat*. This Iſland and a great Quantity of the low Lands, he obſerves has been rais'd out of the Sea, for that the Rocks many Miles up the Country, are beſtuck with Oyſter-Shells

Shells and other Trophies of the Sea. Here he gives a Hiſtory of it how it came into the Poſſeſſion of the *Engliſh*, and of the *Eaſt-India* Company, and of what import it is to them with reſpect to their Trade, *&c.*

Then he ſurveys *Canorine*, an Iſland lying near *Bombaim*, and there deſcribes prodigious Works of Antiquity cut out of the Rocks. From hence he viſits *Baſcin*, a City of the *Portugals*, which he deſcribes with the Remarkables taken notice of in his going and returning, among which, at *Elephanto* was an Idol Temple cut out of a Rock as the former.

Next he relates the Occurrences that he took notice of in his Journey with an Embaſſy ſent to *Sevagi*, whoſe reſidence was on a very high Hill, call'd, *Rairee*, inacceſſible but only by one narrow way. By the by he relates the Ceremonies of crowning the Raya.

From hence he paſſes to *Swally*, the Port of *Surat*, which he deſcribes, and the Company's Factory in that Place; and takes notice of the Valour and Succeſs of a Preſident there in repulſing the Power of *Sevagi*, and dates his Letter from *Surat*, *Jan.* 15. $167\frac{4}{5}$.

In his Third Letter he gives a more particular and more full Account of *Surat*, and its Inhabitants, and firſt takes Notice of Muſſelmen-Beggars, ready to do Miſchief, and of Scuman, or Soldiers being drunk with Sang mixed with Milk. Then he deſcribes the other Inhabitants, their Houſes, Cuſtoms, Heathen and Mahometan Rites, their Way of Entertaining, Diet, Cloathing, Religious Ceremonies, Marriages, Burials, *&c.* then the Vagabond *Fakiers*, or Holy Men, the Peſt of the Place, then the Magiſtrates, Mints, Markets, Fortifications, Soldiers, Moſchs, Caravanſeras, Stables, *&c.* Without the Town, he deſcribes the Tombs of the *Engliſh*, *Dutch* and *Armenians*, *French*, Muſſelmen, Pilgrims, Heathens; and here he mentions their *Fakiers*, or Heathen Prieſts, and their ſtrange

and

and ridiculous Rites and Customs. Then he describes their Tanks, Grottoes, Gardens, the Flowers and Plants; as the Cotton-Tree, Bang, Alluh, (or a Specifick Bark for all Fluxes,) the Sensible Plant, Milk Bathes, Sugar-Canes, Tobacco, &c. And lastly, he describes the River, and its commodiousness for Shipping though they have few Ships of their own, and those managed by unskilful Navigators; nor will the *Dutch* permit them to be taught, least they should prove Enemies: And then by the way he relates the Story of the late Revolution at *Bantam*; after which he proceeds to describe their Solemnities, on Religious Accounts, their Sports and Recreations, the Education of their Children, their Trade, and particularly their Jewellers. Then he describes their Diseases and ways of curing: by the way, he mentions some Rarities in the *English* Factory, amongst other some Pidgeons, Champore Cocks, White casting a little Yellow Amadavad-Birds; nor does he omit to describe the Vermin they are troubled with, as, Rats as big as our Pigs, burrowing under Houses; Mongoose, a sort of Ferret; Musk-Rats; Guianaes; also Centipedes, Scorpions, vast Spiders, poysonous Snakes, Crocodiles: then he describes the *Parseys* what they are, their worshiping the Sun; their exposing their Dead to be devoured by Birds, their Manner of Living, Their Breeding milk white Oxen and Buffalas; and by the way he describes a sort of Bird call'd a Columbine, making a Noise like a Bittern: and concludes this Section with an Account of the Conveniencies the Place affords for the Building Ships, as vast Quantities of Timber, Damar, Cair-yarn, besides good Flax and Hemp, and Iron from the Mountains of the South, so that for Trade, no Place in *India* can equal *Surat*. In his next Section he relates his Passage from *Surat* to *Bombaim*, and thence to *Jenea*; by the way he describes a vast Turtle or Tortoise, and divers other remarkable

markable Occurrances in passing the Mountains, and several Towns and Villages. At *Jenea* he is introduc'd to the Nabob's Presence, where he understands what he was sent for, which was to visit some Patients, *viz.* one of his Wives in the *Haram* the Circumstances of which he relates together with a Description of the *Women*, and their Manner of Living in that Recluse; the other Patient was Brother of the Nobob; he stayed here and visited several Places, as an Emperor's Pallace gone to decay, then an ancient City called, *Dungineſſe*, cut out of a Mountainous Rock, with a Temple and other spacious Halls, not inferior for Antiquity, Workmanship, Water, and other Conveniencies to those of *Canorine*, now left a desolate Habitation for Bats and Wasps. From hence he describes his Ascent to the Top of a Hill accessible but by Seven Gates, where the Nabob's Brother was Governour; where how he was treated, and what else he took notice of he relates, as great Granaries hewed out of Stone, at first supposed for some Religious Use, because of their delicate ingraving; there are several Tanks fill'd with Butter of Four Hundred Years standing, prized by the Gentiles as high as Gold for its Vertue to cure old Aches and sore Eyes, a present of some of which taken out of one of them opened on purpose, was made him, being a black stinking viscous Balsom; there were also Tanks for Water, also Two unshapen Sakers, each 22 Foot long out of which not long before, a Bullet Shot had kill'd a Rajah at Two Course off, which made a Bonfire of Two of his Ladies, and Twenty Domesticks to attend him in another World, as his Physician, Barber, Washerman, Horse-keeper, *&c.* a usual Heathen Custom. Descending in his return he observed many Dens and Caverns cut out of the Rocks, which he believes to be the Works of some Zealots in former Ages: In another Place he takes notice of a sort of shining Flies, which made a Tree look as if all

in

in a Flame,and which presently would receive its native Verdure,at which his Coolyes were afrightned.In a Third he takes notice of Frogs of a prodigious Magnitude, as also of a Tree called the Nury-tree, which always Blossoms in the Night, and sheds them soon after Sun Rising. He describes also the Moor Priests, their Mosks and Service in them: and last of all his Arrival at *Bombaim*, whence he dates his Letter, *Sept.* 22. 1675.

'Tis very remarkable in these Letters, that the Author has given us so many Instances of those Prodigious Works of Antiquity, of cutting such vast Temples or Rooms out of the natural Rock, which seems to have much out-lasted the History of the Authors of them, and possibly all other Heathen History; the Grandure and Magnificence of them seeming to speak them to have been of the first, and now unknown Ages of the World, such as were also the Pyramids of *Ægypt*, and the Labyrinths, concerning which we have no true Records, but only some conjectural Fictions, or groundless Traditions. But indeed of the two, these Subterraneous Cavities seem to be of the greatest Antiquity and Possibly to have given occasion to construct the Superterranean Fabricks, for 'tis probable that the Heat of the Climate where they were first begun, and the natural Cavities in the Mountains and Rocks might administer the first Occasion of the artificial making of them, and that was in Probability first done by the *Æthiopians*, who were the Instructors and Tutors to the *Ægyptians*, from whom they received their Hieroglyphicks, as is testified by *Diodorus Siculus*. Now the *Æthiopians* inhabiting a Climate so very hot, could not well tolerate the Mid-day-Heats, without sheltering themselves under the Shade of some Trees or Rocks, till the Violence thereof was abated; and that Country, especially the Higher *Æthiopia*, affording many natural Caverns in the Mountains, which

must

muſt neceſſarily be moſt refreſhing in the Hotteſt Seaſons, by reaſon of the Excluſion of the Sun-Beams, and by reaſon of the Body of Stone or Earth over their Heads; as may be manifeſtly experimented here in Churches Vaulted with Stone, and much more in Vaults under Ground. Theſe Caverns in probability invited the Natives there to ſhelter themſelves, and that might put ſome of the better ſort, or the Princes, to make uſe of Art, to fit and make them more convenient for Uſe, and by degrees for Ornament, and by further Degrees for Religious or Superſtitious Uſes; for ſuch we are inform'd were the Places where the Sybilline Oracles were delivered, and by degrees for Sepulture, ſuch as the Guanches in *Teneriff* have appropriated to their Anceſtors, and ſuch as the *Ægyptians* made uſe of for Repoſitories of their Mummeys; and ſuch alſo ſeem to have been the Wells and Grottoes for the Mummeys, the Labyrinths and the Subterranean Temples of *Ægypt*. Now as the natural Subterraneous Caves ſeem to have been the Occaſion of all theſe artificial ones, and their Embeliſhments under the Ground, ſo the great Rocks, Maſſes of Stone and Mountains, ſeem to have given the Occaſion of ſhaping and cutting of them into ſeveral Forms, for ſeveral Deſigns; ſuch I conceive were the Rocks ſhaped into a Sphynxes Head in *Ægypt*, and the Two Rows of Rooms on Two Sides of a Square for the great Pyramid; and the caſing of ſuch a ſhaped Rock with Aſhler or Blocks of other Stone, made the great Pyramid it ſelf. Now in Probability this Practice was from *Ægypt* ſpread far and near into the Eaſt, together with Idolatry, Superſtition, and other Heatheniſh Rites and Cuſtoms, and there are, it ſeems, many Relicts of them remaining to this Day in theſe Places. But beſides theſe Remainders of Antiquity in theſe Weſtern Parts, of *Aſia* and *Ægypt*, we find they were not wanting in the Eaſternmoſt Parts

of *Asia* likewise, who have as good Reason to pretend to Antiquity, and possibly much better than *Ægypt*, *Æthiopia*, *Chaldea*, *&c.* for that we are inform'd by the Descriptions of the vast Empire of *China*, that they have many Mountains formed by Art into various Shapes, that they have and do still make use of inaccessible Mountains for their Safe-guard against Incursions and Invadings of their Enemies, and for living quiet and secure from their Foreign Disturbers; for which Use some of these mentioned by the Doctor, do manifestly seem to have been occasioned. Besides, we find that the Heathen Priests did much affect to make use of the Tops of Hills and Mountains, and the Caverns and Caves of Rocks and Hills, for the places of their Idolatrous Worship, and for delivering of their Oracles; for which, 'tis not unlikely but that some of these were at first design'd, though they have been since deserted or converted to other Uses.

But to leave these Enquiries to the Scrutiny and Judgment of more knowing Antiquaries, I shall proceed to give some farther Account of the Contents of his other Letters. In his Fourth Letter, there he gives an Account of the *Canatick* Country; and first he describes *Carwar*, and the Fleet of *Sevagi* there: next *Goa*, and all that is remarkable in and about that City; then an Excursion to *Gocourn*, where he relates the strange Rites of a Heathen Solemnity, and adds a Discourse of the bordering Princes and Governments, as also of the wild Beasts of the Woods, as Tigers, Apes, *&c.* and of the Trees and Fruits, as the *Bamboos*, *Cassia Fistula*, *Tamarind-Tree*, *Indian* Oak, *Nux Vomica*, *Mangoes*, *Cheruses*, *Ananas*, *&c.* then adds a summary Description of the whole Country, and its Products in general, as of its Mountains, Plains, Woods, Rivers, the Minerals, Vegetables, Animals, the People and their Constitutions, and Customs, Housing, Cloathing,

Cloathing, Diet, their Occupations, and laſtly, a very particular Account of their Weights, Meaſures, and Coyns, in which he has amaſſed together ſo many Remarkables, that 'tis very difficult to give an Abſtract or Epitomy of them.

In his Fifth Letter he gives an Account of his leaving this Country, and his ſailing to *Perſia*, and landing at *Gembroon*, relating all the Particulars he remarkt in his Voyage; and after a Deſcription of this Place, he relates the Particulars he obſerved in his Travels by Land to *Siras*, and then to *Perſepolis* or *Chalminor*, both which he deſcribes, and a multitude of curious Obſervations which he took notice of by the way: from thence he relates his Progreſs into *Parthia*, and ſo to *Spahan*, where he deſcribes all that is remarkable in and about that City, as at *Jelfa* a part of its Suburbs, where live Six Thouſand Families of *Armenians*, ſome *French* Artizans, and the ancient *Gabers*, *Gauraas*, or true old *Perſians*, (whoſe preſent Condition he relates) as alſo that of the *Armenians* and *Georgians*, and all their Religious Rites and Ceremonies; in the Place it ſelf he firſt deſcribes the Emperor's Palace and the Rareties thereof, together with the Diverſtiſements; and adds a Catalogue of Plants he found there to flouriſh, with the Times and Nature of the Seaſons: Then he relates his Journey to *Gombroom*, in the Winter, and his Return to *Spahan* in the Spring; and then his Voyage to *Congo* for Pearl, all whoſe Sorts he deſcribes with their Values, *&c.*

After this he gives a more full and particular Account of the preſent State of all *Perſia*, both Geographical, and Political, compriſing the Natural and Civil Hiſtory thereof, and that more fully than I have met with in any other Author.

His

His Sixth and Seventh Letters give an Account of ſome Broils and Revolutions that happened in and about *Surat*, during his ſtay there, and a further Account of the Great Mogul and his Actions and Power.

His Eighth Letter is a Journal of his Voyage in his Return to *England*, wherein he relates the Hiſtory of St. *Helena*, and deſcribes the Iſland of *Aſcenſion* more particularly than I have elſewhere found it; and laſt of all, his Landing in *Kent*, *Auguſt* the 20th. 1682. from whence he dates his laſt Letter.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

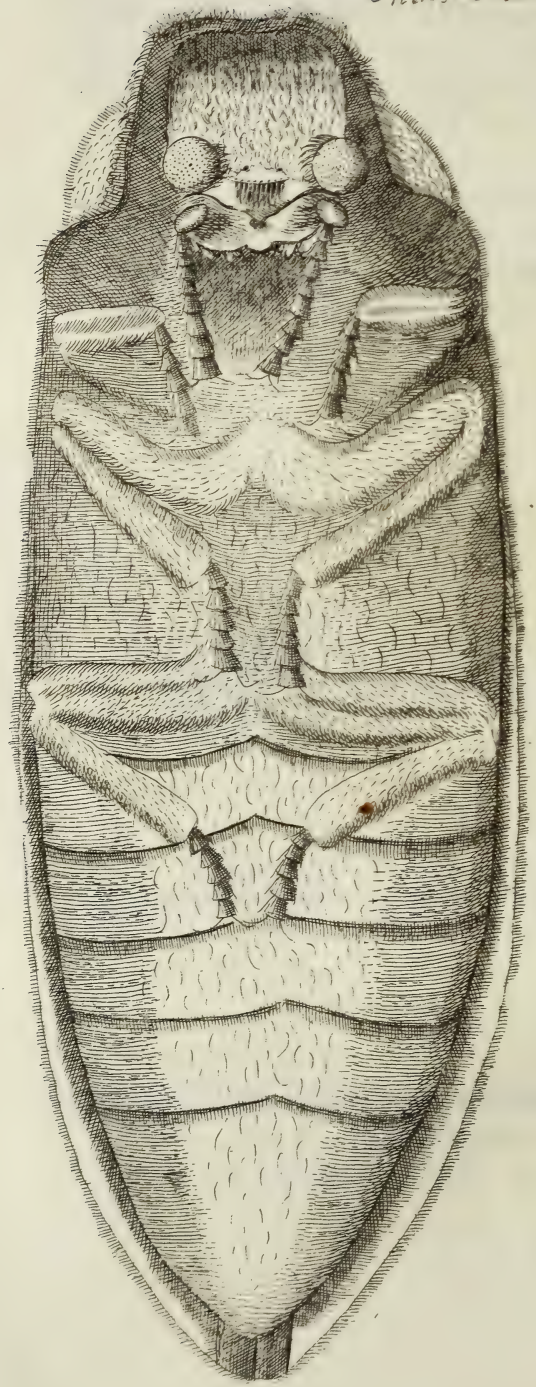


Fig. 1.

PHILOSOPHICAL TRANSACTIONS.

For the Month of October, 1698.

The CONTENTS.

I. *A Relation of the Symptoms that attended the Death of Mr.* Robert Burdett, *an* Engliſh *Merchant of* Aleppo, *who was killed by the Bite of a Serpent. Communicated by Mr.* Aaron Goodyear, *who was then preſent.* II. *A Letter of Dr.* John Wallis, *(Geom. Prof. Oxon, and F. R. S.) to Mr.* Thomas Beverly; *Concerning his Method for Inſtructing Perſons* Deaf *and* Dumb. III. *Part of a Letter from Mr.* Witſen, *Burgermaſter of* Amſterdam, *and F. R. S. to Dr.* Martin Liſter, *fellow of the Colledge of Phyſicians, and R. S. concerning ſome late Obſervations in* Nova Hollandia. IV. *Some Philoſophical Experiments, communicated by the Right Honourable Sir* Robert Southwell, *V. P. R. S.* 1. *To make the Globe Looking-glaſs.* 2. *To Paint a Globe-Glaſs, or any other, in Marble Colour.* 3. *The*

Magick Lanthorn. 4. *Phosphorus Metallorum.* V. *Part of Two Letters from Dr.* Cay, *to Dr.* Martin Lister, *Fellow of the Colledge of Physicians and Royal Society; concerning some Mineral Waters.* VI. *Excerpta ex literis D. Cassini ad P. Fontenay Mathematicum Regium apud Sinas.* VII. *Quadratura Logarithmicæ. Autore Jo. Craig.* VIII. *An Account of a Gall-Bee, and the Death-Watch. By Mr.* Benj. Allen. IX. *An extract of a Letter from Dr.* Rob. St. Clair, *to Dr.* Rob. Hook, *F. R. S. giving an Account of a very odd Eruption of Fire out of a Spot in the Earth near* Fierenzola *in* Italy, *with an easy Contrivance of a Lamp to be kept always full whilst it burns.* X. *A Copy of a Letter from* R. P. *Vicar of* Kildwick *in* Yorkshire, *to a Friend of his in those Parts, wherein he gives an Account of an Extraordinary Eruption of Water, which happened in* June, 1686. XI. *Some Experiments about Freezing. By Mr.* Desmasters. *Communicated by Dr.* William Musgrave, *Fell. Coll. Phys. and R. S.* XII. *A Catalogue of Electrical Bodies. By the late Dr.* Rob. Plot, *F. R. S.* XIII. *An Account of a Book. Histoire des Plantes qui naissent aux environs de Paris, avec leur usage dans la medecine. par Mr. Pitton Tournefort de l'Academir Royale*

ale des Sciences, Docteur en Medicine de la Faculte de Paris, & Profeſſeur en Botanique au Jardin Royal des Plantes. A Paris de l'imprimerie royale. 1698. 8vo. *XIV. An Account of Books newly printed beyond Sea. XV. An Account of Books now Printing beyond Sea.*

I. *A Relation of the Symptoms that attended the Death of Mr.* Robert Burdett, *an Engliſh Merchant of* Aleppo, *who was kill'd by the Bite of a Serpent. Communicated by Mr.* Aaron Goodyear, *who was then preſent.*

MR. *Robert Burdet,* on the Fourth of *October,* 1678. was bit by a Serpent on the Left Wriſt, near the Pulſe towards his Hand; it ſeem'd at firſt like two Pricks of a Pin, he immediately vomited, and his Wriſt and Hand begun to ſwell preſently; he had ſome few Days before a Looſeneſs, which perhaps this increaſed; he rode eaſily alone, after he was bit, (above two Miles off) to *Aleppo,* from the Borders of the Vineyards by *Nerope* Plain; aſſoon as he got to his Chamber, he ſaid, he was bit by a Rat (and would not own it was a Serpent) though a *Turk* accidentally paſſing by, ſaid, he ſaw the Serpent hang at his Wriſt, as he pull'd his Hand out of the Refuge, hoping to have taken a Hare that he had Cours'd in there; he ſaid, he felt no pain, but a great deſire to ſleep; his Arm continued ſwelling upwards, and grew black; ſome little Remedies were uſed till the reſt of the Factory return'd, who knew nothing of this, he being then alone, from the reſt in the Field; then they begun to Cup and ſcarifie his Arm; he having ſtill no Pain, but a great Drowſi-

Drowzineſs; but was kept waking, to uſe that little time he had left, to prepare himſelf for Death; which he perform'd exceedingly well; at laſt the Swelling came up to his Shoulder, and then he complain'd much; and within a Quarter of an Hour died. He was bit about Ten in the Forenoon, and died about Three in the Afternoon; his Body ſwell'd much after Death, and purg'd. The Snake was like a common Snake, for length; his Colour dark ſandy, with black Spots; his two Teeth, or Fangs are like thoſe of a Rattle-Snake, on the Upper Jaw; the Poyſon lies in the Gums; and wherever they fetch Blood of any Creature they certainly kill; though in ſome Parts ſooner than in others. The Oyl of Tobacco kills the Serpent, if put in his Mouth, as was experienced. The People of the Country ſay, that if, as ſoon as any one is bit by a Serpent, they ſhall ſuck immediately the Wound, they may be ſaved; but they rub firſt their Gums and Teeth with Oyl, that none of the Poyſon may touch any Place; where the Skin is broken, and ſpit out immediately what they ſuck, every time waſhing the Mouth, and taking more Oyl. This Serpent kill'd a Dog, in about Eight Minutes time, biting him at the end of his Ear; and two young Turkeys afterwards in three or four Minutes each, biting them at the end of a Claw; and then we poyſon'd him with the Oyl of Tobacco out of a Reed Pipe (that had been much uſed, and not cleanſed for a Week or Two) and he died in about two or Three Minutes, trembling as ſoon as the Oyl was dropt into his Mouth. There are People that get their Bread by taking and ſhewing theſe Serpents: They find them in hot Days near Rocks, or the Mountains, and elſewhere; putting a Stick nigh their Head, take them up carefully by the Neck, as you hold a Rabbit, and putting them into a Leather Bag, carrying them about to ſhew.

II.

A Letter of Dr. John Wallis, *(Geom. Prof. Oxon, and F. R. S.) to Mr.* Thomas Beverly; *Concerning his Method for Inſtructing Perſons* Deaf *and* Dumb.

SIR,

I Have recieved your Letter of *Sept.* 22. Wherin you tell me the caſe of a Family, wherein you are concerned; which is really very ſad. Of *Eight* Children now living, *Five* are Deaf and Dumb. (And, I ſuppoſe, *Dumb* becauſe *Deaf.*)

You deſire my Directions, How beſt to ſupply that Defect: Having had ſome Acquaintance (I underſtand) with Mr. *Alexander Popham*, (who, I think, is yet living,) whom (being born Deaf) I taught (about four or five and thirty years ago) to Speak diſtinctly, (though I doubt, he may now have forgot much of it;) And, to Underſtand a Language, ſo as to expreſs his mind (tolerably well) by Writing, and to underſtand what is written to him by others. As I had, before, taught Mr. *Daniel Whaley*: Who was Deaf alſo; but is lately dead.

Others, who were not Deaf, but had great Impediments in their Speech, (who Stuttered extremely, or who have not been able to pronounce ſome Letters,) I have taught to Speak very Diſtinctly, and to pronounce thoſe letters which before they could not: So as perfectly to con-

quer that difficulty; at leaſt ſo as that it was very little (if at all) diſcernable.

Some other Deaf perſons, I have not attempted teaching them to Speak; but onely ſo as (in good meaſure) to underſtand a Language, and to expreſs their mind (tolerably well) in Writing. Who have thereby attained a much greater meaſure of Knowledge in many things, than was thought attainable to perſons in their circumſtances; and become capable (upon further improvement) of ſuch further Knowledge as is attainable by Reading.

The former part of this Work (teaching to *Speak*, or to *ſpeak Plain*) is to be done, by Directing them to Apply their Tongue, Lips, and other Organs of Speech, to ſuch Poſtures and Motions, as are proper for the Formation of ſuch and ſuch Sounds (reſpectively) as are uſed in Speech. And, then, the Breath, emitted from the Lungs, will Form thoſe Sounds; whether the perſon Speaking do Hear himſelf, or not.

Of which reſpective Formation, of all Sounds commonly uſed in Speech, I have given a full Account (and, I think, I am the firſt who have done it,) in my Treatiſe *De Loquela*; prefixed to my *Grammar* of the *Engliſh Tongue*; firſt publiſhed in the year 1653. In purſuance of which, I attempted the Teaching of Deaf perſons to ſpeak.

And this is indeed the Shorter work of the Two. (however looked upon as the more Stupendous.) But this, without the other, would be of little uſe. For, to pronounce words only as a Parrot, without knowing what they ſignify, would do us but little ſervice. And it would by degrees (without a Director to correct Miſtakes) come to be loſt in part. For, like as one who Writes a fair Hand, if he become Blind, would ſoon forget the exact Draught of his Letters, for want of an Eye to direct his Hand: So he, who doth not Hear himſelf Speak, muſt needs be apt to forget the Niceneſs of Formation (without a Prompter) for want of an Ear to regulate his Tongue.

The other part of the Work (to teach a Language) is what you now inquire about.

In order to this; it is Neceſſary in the firſt place, That the Deaf perſon be taught to Write. That there may be ſomewhat to expreſs to the Eye, what the Sound (of Letters) repreſents to the Ear.

'Twill next be very Convenient (becauſe Pen and Ink is not alwaies at hand) that he be taught, How to deſign each Letter, by ſome certain Place, Poſition, or Motion, of a Finger, Hand or other Part of the Body; (which may ſerve inſtead of Writing.) As for inſtance, The five Vowels *a e i o u*; by pointing to the Top of the five Fingers: And the other Letters *b c d* &c. by ſuch other place or poſture of a Finger, or otherwiſe, as ſhall be agreed upon.

After this; a Language is to be taught this *Deaf* perſon, by like methods as Children are at firſt taught a Language; (though the thing perhaps be not heeded.) Onely with this difference: Children learn *Sounds* by the Ear; but the Deaf perſon is to learn *Marks* (of thoſe ſounds) by the Eye. But both the one and the other, do equally ſignify the

the ſame Things or Notions; and are equally (*ſignificantia ad placitum*) of meer Arbitrary Signification.

'Tis then moſt natural (as Children learn the Names of Things) to furniſh him (by degrees) with a *Nomenclator*; containing a competent number of Names, of things common and obvious to the Eye; (that you may Shew the Thing anſwering to ſuch a Name.) And theſe digeſted under convenient Titles; and placed (under them) in ſuch convenient Order (in ſeveral Columnes, or other orderly ſituation in the Paper,) as (by their Poſition) beſt to expreſs, to the Eye, their Relation or Reſpect to one another. As, *Contraries* or *Correlatives*, one over againſt the other; *Subordinates* or *Appurtenances*, under their Principals. Which may ſerve as a kind of *Local Memory*.

Thus, (in one Paper) under the title *Man-kind*, may be placed, (not Confuſedly, but in decent Order,) *Man*, *Woman*, *Child*, (*boy*, *girle*;) And, if you pleaſe, the Names of ſome known perſons, (of the family, or others:) with Spaces left to be ſupplied with other like Names or Words, as after there may be occaſion.

Then (in another Paper) under the Title *Body*, may be written (in like convenient order) *Head*, (*hair*, *skin*, *ear*,) *Face*, *forhead*, *eye*, (*eye-lid*, *eye-brow*,) *cheek*, *noſe*, (*noſtril*,) *mouth*, (*lip*, *chin*.) *Neck* (*throat*.) *Back*, *Breaſt*, *Side*, (*right-ſide*, *left-ſide*.) *Belly*, *Shoulder*, *Arm*, (*elbow*, *wriſt*, *hand*, (*back*, *palm*,) *finger*, (*thumb*, *knuckle*, *nail*.) *Thigh*, *knee*, *leg*, (*ſhin*, *calf*, *anckle*,) *foot*, (*heel*, *ſole*,) *toe*. With like Spaces, as before, for more to be added, as there is occaſion.

And when he hath learned the import of Words in each Paper; let him Write them (in like manner) in diſtinct Leaves or Pages of a Book (prepared for that purpoſe) to confirm his Memory, and to have recourſe to it upon occaſion.

In a Third Paper, you may give him the *Inward* parts. As, *Scul*, (*brain*,) *Throat*, (*wind-pipe*, *gullet*,) *ſtomach*, (*guts*,) *heart*, *lungs*, *liver*, *ſplene*, *kidney*, *bladder*, (*urine*,) *vein*, (*bloud*,) *bone*, (*marrow*,) *fleſh*, *fat*, &c.

In another Paper, under the title *Beaſt*, may be placed; *Horſe* (*ſtone-horſe*, *gelding*,) *mare*, (*colt*.) *Bull*, (*ox*,) *cow*, *calf*. *Sheep*, *ram*, (*wether*,) *ew*, (*lamb*.) *Hog*, *boar*, *ſow*, *pig*. *Dog*, (*maſtif*, *hound*, *grey-hound*, *ſpannel*,) *bitch*, (*whelp*, *puppy*.) *Hare*, *rabbet*. *Cat*, *mowſe*, *rat*, &c.

Under the title *Bird*, or *Fowl*; put *Cock*, (*capon*,) *hen*, *chick*. *Gooſe*, (*gander*,) *goſling*. *Duck* (*drake*,) *Swan*, *Crow*, *Kite*, *Lark*, &c.

Under the title *Fiſh*, put *Pike*, *Eel*, *Plaice*, *Salmon*, *Lobſter*, *Crab*, *Oiſter*, *Crawfiſh*, &c.

You may then put *Plants* or *Vegetables*, under ſeveral *Heads*, or *Subdiviſions* of the ſame Head. As, *Tree*, (*root*, *body*, *bark*, *bough*, *leaf*, *fruit*;) *Oak*, *aſh*, *apple-tree*, *pear-tree*, *vine*, &c. *Fruit*, *apple*, *pear*, *plum*, *chery*, *grape*, *nut*, *orange*, *lemon*. *Flower*; *roſe*, *tulip*, *gilofer*. *Herb*, (*weed*,) *graſs*. *Corn*; *wheat*, *barly*, *ry*, *pea*, *bean*.

And the like of *Inanimates*. As, *Heaven*; *ſun*, *moon*, *ſtar*. *Elements*; *earth*, *water*, *air*, *fire*. And, (under the title *Earth*;) *clay*, *ſand*, *gravel*, *ſtone*. *Metal*; *gold*, *ſilver*, *braſs*, (*copper*,) *iron*, (*ſteel*,) *lead*, *tin*, (*pewter*,) *glaſs*. Under the title; *Water*; put *Sea*, *pond*, *river*, *ſtream*. Under

that of *Air*; put *Light*, *dark*, *miſt*, *fog*. *Cloud*; *wind*, *rain*, *hail*, *ſnow*; *thunder*, *lightening*, *rain-bow*. Under that of *Fire*; *Coal*, *flame*, *ſmoke*, *ſoot*, *aſhes*.

Unde the title *Clothes*; put *Woollen*, (*cloth*, *ſtuff*,) *Linen*; (*holland*, *lawn*, *lockarum*,) *Silk*, (*Satin*, *Velvet*.) *Hat*, *cap*, *band*, *doublet*, *breeches*, *coat*, *cloak*, *ſtockings*, *ſhoe*, *boot*, *ſhirt*, *petty-coat*, *gown*, &c.

Under the title *Houſe*; put *Wall*, *roof*, *door*, *window*, (*caſement*,) *room*.

Under *Room*: put *Shop*, *hall*, *parlour*, *dining-room*, *chamber*, (*ſtudy*, *cloſet*,) *kitchin*, *cellar*, *ſtable*, &c.

And, under each of theſe, (as diſtinct *Heads*,) the *Furniture* or *Utenſils* belonginging thereunto; (with Diviſions and Subdiviſions, as there is occaſion;) which I forbear to mention, that I be not too prolix.

And, in like manner, from time to time, may be added more Collections or Claſſes of Names or Words, conveniently digeſted under diſtinct Heads, and ſutable Diſtributions; to be written in diſtinct Leaves or Pages of his Book; in ſuch order as may ſeem convenient: Which I leave to the prudence of the Teacher.

When he is furniſhed with a competent number of Names, (though not ſo many as I have mentioned:) it will be ſeaſonable to teach him (under the titles *Singular*, *Plural*,) the Formation of Plurals from Singulars; by adding *s* or *es*. As, *Hand*, *hands*; *Face*, *faces*; *Fiſh*, *Fiſhes*, &c. with ſome few Irregulars; As, *Man*, *men*; *Womon*, *women*; *Foot*, *feet*; *Tooth*, *teeth*; *Mowſe*, *Mice*; *Lowſe*, *lice*; *Ox*, *oxen*, &c.

Which (except the Irregulars) will ſerve for *Poſſeſſives* (to be after taught him,) which are formed from their Primitives, by like addition of *s* or *es*. Except ſome few Irregulars; As, *My*, *mine*; *Thy*, *thine*; *Our*, *ours*; *Your*, *yours*; *His*; *Her*, *hers*; *Their*, *theirs*, &c.

And in all thoſe, and other like caſes, it will be proper firſt to ſhew him the *Particulars*, and then the General *Title*.

Then teach him (in another Page, or Paper) the *Particles*; *A*, *an*; *The*, *this*, *that*; *Theſe*, *thoſe*.

And the *Pronouns*; *I*, *me*, *my*, *mine*; *Thou*, *thee*, *thy*, *thine*; *We*, *us*, *our*, *ours*; *Yee*, *you*, *your*, *yours*; *He*, *him*, *his*; *Shee*, *her*, *hers*; *It*, *its*; *They*, *them*, *their*, *theirs*; *Who*, *whom*, *who's*.

Then, under the titles *Adjective*, *Subſtantive*; teach him to connect theſe. As, *My hand*, *Your head*, *His foot*, *His feet*, *Her arm*, *arms*, *Our hats*, *Their ſhoes*, *John's coat*, *William's band*, &c.

And, in order to furniſh him with more Adjectives; Under the title *Colours*, you may place *Black*, *white*, *gray*, *green*, *blew*, *yellow*, *red*, &c. And, having ſhewed the Particulars; let him know, Theſe are called *Colours*.

The like for *Taſt*, and *Smell*; As, *Sweet*, *bitter*, *ſour*, *ſtink*.

And, for *Hearing*; *Sound*, *noiſe*, *word*.

Then, for *Touch* or *Feeling*: *Hot*, (*warm*,) *Cold*, (*cool*,) *Wet*, (*moiſt*,) *Dry*; *Hard*, *ſoft*; *Tough*, *brittle*; *Heavy*, *light*, &c.

From whence you may furniſh him with more Examples of *Adjectives with Subſtantives*; As, *White bread*, *Brown bread*, *Green graſs*, *Soft cheeſe*, *Hard cheeſe*, *Black hat*, *My black-hat*, &c.

And then, inverting the order, *Subſtantive and Adjective* (with the Verb

Verb Copulative between:) As; *Silver is white*; *Gold is yellow*; *Lead is heavy*; *Wood is light*; *Snow is white*; *Ink is black*; *Flesh is soft*; *Bone is hard*; *I am sick*; *I am not well*, &c. Which will begin to give him some notion of *Syntax*.

In like manner, when *Substantive and Substantive* are so connected. As; *Gold is a Metal*; *A Rose is a Flower*; *Wee are men*; *They are women*; *Horses are beasts*; *Geese are Fowls*; *Larks are Birds*, &c.

Then, as those before relate to *Quality*, you may give him some other words relating to *Quantity*. As; *Long*, *short*; *Broad*, *narrow*; *Thick*, *thin*; *High*, (*tall*,) *low*; *Deep*, *shallow*; *Great*, (*big*,) *small*, (*little*;) *Much*, *little*; *Many*, *few*; *Full*, *empty*; *Whole*, *part*, (*piece*;) *All*, *some*, *none*; *Strong*, *weak*; *Quick*, *slow*; *Equal*, *unequal*; *Bigger*, *less*.

Then, words of *Figure*; As, *Streight*, *crooked*; *Plain*, *bowed*; *Concave*, (*hollow*) *convex*; *Round*, *square*, *three-square*; *Sphere*, (*globe*, *ball*, *boul*;) *Cube*, (*die*;) *Upright*, *sloping*; *Leaning forward*, *leaning backward*; *Like*, *unlike*.

Of *Gesture*; As, *Stand*, *ly*, *sit*, *kneel*, *stoop*.

Of *Motion*; As, *Move*, (*stir*,) *rest*; *Walk*, (*go*, *come*;) *Run*; *Leap*; *Ride*; *Fall*, *rise*; *Swim*, *sink*, (*drown*;) *Slide*; *Creep*, (*crawl*;) *Fly*; *Pull*, (*draw*,) *thrust*, *throw*; *Bring*, *fetch*, *carry*.

Then, words relating to *Time*, *Place*, *Number*, *Weight*, *Measure*, *Money*, &c. are (in convenient time) to be shewed him, distinctly. For which the Teacher, according to his discretion, may take a convenient season.

As likewise, The *Time of the Day*; The *Days of the Week*; The *Days of the Month*; The *Months of the Year*; and other things relating to the the *Almanack*t Which he will quickly be capable to understand, if Methodically shewed him.

As likewise, the *Names* and *Situations*, of *Places*, and *Countries*, which are convenient for him to know. Which may be orderly written in his Book; and shewed him in *Maps*, of *London*, *England*, *Europe*, *the World*, &c.

But these may be done at leisure; As likewise, the Practice of *Arithmetick*, and other like pieces of Learning.

In the mean time; (after the Concord of *Substantive and Adjective*;) he is to be shewed (by convenient Examples) that of the *Nominative and Verb*. As, for instance, *I go*, *You see*, *He sits*, *They stand*, *the Fire burns*, *the Sun shines*, *the Wind blows*, *the Rain falls*, *the Water runs*; and the like: with the Titles in the top, *Nominative*, *Verb*.

After this, (under the titles, *Nominative*, *Verb*, *Accusative*,) give him Examples of Verbs *Transitives*; As, *I see you*, *You see me*, *The Fire burns the Wood*, *The Boy makes a Fire*, *The Cook roasts the Meat*, *The Butler lays the Cloth*, *We eat our Dinner*.

Or even with a *Double Accusative*; As, *You teach me* (*Writing*, *or*) *to Write*; *John teacheth me to Dance*; *Thomas tells me a Tale*, &c.

After this; you may teach him the *Flexion* or *Conjugation* of a *Verb*; or, what is equivalent thereunto. For, in our English Tongue, each Verb hath but Two *Tenses* (the *Present* and the *Preter*) and Two *Partici-*

ples (the *Active* and the *Passive.*) All the rest is performed by *Auxiliaries.* Which (Auxiliaries) have no more Tenses, than the other Verbs.

Those *Auxiliaries,* are, *Do, did*; *Will, would*; *Shall, should*; *May, might*; *Can, could*; *Must, ought to*; *Have, had*; *Am* (*be,*) *Was.* And if, by Examples, you can insinuate the signification of these Few Words: you will have taught him the whole Flexion of the Verb.

And here it will be convenient, (once for all,) to Write him out a full Paradigm of some one Verb, (suppose, *to See,*) through all those Auxiliaries.

The Verb it self, hath but these Four Words to be learned; *See, saw, seeing, seen.* Save that, after *Thou* in the Second Person singular (in both Tenses) we add *est*; and, in the Third Person singular (in the Present Tense) *eth* or *es*: Or, instead thereof, *st, th, s.* And so in all Verbs.

Then, to the Auxiliaries, *Do did, Will would, Shall should, May might, Can could, Must ought to,* we adjoin the Indefinite *See.* And, after *Have had, Am* (*be*) *was*, the Passive Participle *Seen.* And so for all other Verbs.

But the Auxiliary *Am* or *Be*, is somewhat Irregular; in a double form;

Am, art, is; Plural, *Are. Was, wast, was*; Plural, *Were.*
Be, beest, be; Plural, *Be. Were, wert, were*; Plural, *Were.*
Be (*am,*) *was, being, been.*

Which (attended with the other Auxiliaries) make up the whole *Passive Voice.*

All Verbs (without Exception) in the *Active Participle*, are formed by adding *ing*; As, *See, seeing*; *Teach, teaching*, &c.

The *Preter tense*, and the *Passive Participle*, are formed (regularly) by adding *ed.* But are oft subject to *Contractions*, and other *Irregularities*, (sometime, the same in both; some time, different.) And therefore it is convenient, here, to give a Table of Verbs (especially the most usual) for those *Three* cases. (Which may, at once, teach their *Signification*, and their *Formation.*) As, *Boil, boiled, boiled*; *Rost, rosted, rosted*; *Bake, baked, baked*; &c. *Teach, taught, taught*; *Bring, brought, brought*; *Buy, bought, bought*, &c. *See, saw, seen*; *Give, gave, given*; *Take, took, taken*; *Forsake, forsook, forsaken*; *Write, wrote, written*; &c. With many more, fit to be learned.

The Verbs being thus dispatched; he is then to learn the *Prepositions.* Wherein lies the whole Regimen of the Noun. (For Diversity of *Cases*, we have none.) The force of which is to be insinuated by convenient Examples, suited to their different Significations. As, for instance,

Of, *A piece* of *bread*; *A pint* of *Wine*; *The cover* of *a pot*; *The colour* of *gold*; *A ring* of *gold*; *A cup* of *silver*; *The Mayor* of *London*; *The longest* of *all*; &c.

And in like manner for, *Off, on, upon*; *To, unto, till, untill*; *From*; *At*; *In* (*within,*) *out* (*without*;) *Into, out of*; *About, over, under*; *Above, below*; *Between, among*; *Before, behind, after*; *For*; *By*; *With, through*; *Against*; *Concerning*; And, by this time, he will be pretty well inabled to understand a Single Sentence.

In the last place; he is (in like manner) to be taught *Conjunctions.* (Which serve to connect, not *Words* onely, but *Sentences.*) As, *And, also,*

alſo, likewiſe; *Either, or, whether*; *Neither, nor*; *If, then*; *Why* (*wherefore,*) *becauſe, therefore*; *But, through, yet*; &c. And theſe illuſtrated by convenient Examples, in each caſe. As,

Becauſe I am cold; *therefore* I go to the fire; *that* I may be warm; *For* it is cold wether.

If it were fair, *then* it would be good walking: *But* (however) *though* it rain, *yet* I muſt go; *becauſe* I promiſed. With oiher like inſtances.

And, by this time, his Book, (if well furniſhed with plenty of Words; and thoſe well digeſted, under ſeveral Heads, and in good Order; and well recruited from time to time as new words occur;) will ſerve him in the nature of a *Dictionary* and *Grammar*.

And, in caſe the Deaf Perſon be otherwiſe of a good Natural Capacity; and the Teacher of good Sagacity; By this method (proceeding gradually, ſtep by ſtep,) you may (with Diligence and due Application, of Teacher and Learner,) in a Years time, or thereabouts, perceive a greater progreſs than you would expect: and a good Foundation layd for further Inſtruction, in matters of *Religion*, and other *Knowledge* which may be taught by Books.

It will be convenient, all along, to have Pen Ink and Paper ready at hand, to write down in Words, what you ſignify to him by Signes; and cauſe Him to Write (or ſhew him how to Write) what He ſignifies by Signes. Which way (of ſignifying their mind by Signes) Deaf perſons are often very good at. And we muſt endeavour to learn Their language (if I may ſo call it) in order to teach them Ours: By ſhewing, what *Words* anſwer to their *Signes*.

'Twill be convenient alſo, as you go along, (after ſome convenient progreſs made,) to Expreſs (in as plain language as may be) the import of ſome of the Tables. As, for inſtance,

The *Head* is the Higheſt part of the *Body*; the *Feet*, the Loweſt part; The *Face* is the Fore-part of the *Head*; The *Forhead* is Over the *Eyes*; The *Cheeks* are Under the *Eyes*; The *Noſe* is betwen the *Cheeks*; The *Mouth* is Under the *Noſe*, and Above the *Chin*, &c.

And ſuch Plain Diſcourſe, put into Writing, and particularly explained; will teach him by degrees to underſtand Plain Sentences. And like Advantages, a Sagacious Teacher, may take as occaſion offers it ſelf from time to time.

Thus I have, in a Long *Letter*, given you a Short Account of my Methods (uſed, in ſuch caſes, with good Succeſs;) which to do at Large, would require a *Book*.

I have taken the pains to draw-up this method, (which is what I have purſued my ſelf in the like caſe,) as apprehending it may be of uſe to ſome others when I am dead. And I am not deſirous it ſhould dy with me.

And I have done it as plainly as I could, that it may be the better underſtood.

I have given onely ſome ſhort Specimens of ſuch Tables as I had made for my own uſe, and the uſe of thoſe whom I was to inſtruct; but to give them at large, would be more than the work of a Letter; and they are to be varied, as the Circumſtances of the Perſons, and

and the Places may require, or the prudence of a Teacher ſhall find expedient.

It is adjuſted to the Engliſh Tongue, becauſe ſuch were the perſons I had to deal with.

To thoſe of another Language, it muſt be ſo altered as ſuch Language requires. And perhaps will not be ſo eaſily done for another Language as for the Engliſh. The Flexion of Nouns, the Conjugation of Verbs, the Difference of Genders, the Variety of Syntax &c. doth in other Languages give a great deal of trouble, which the Simplicity of our Language doth free us from. But this is not my preſent buſineſs.

I Am,

Oxford,
Sept. 30.
1698.

Sir,

Yours to ſerve you,

JOHN WALLIS.

III. *Part of a Letter from* Mr. Witſen, *Burgermaſter of* Amſterdam, *and F. R. S. to Dr.* Martin Liſter, *fellow of the Colledge of Phyſicians, and R. S. concerning ſome late Obſervations in* Nova Hollandia.

HEre is returned a Ship, which by our *Eaſt India* Company, was ſent to the South Land, called, *Hollandia Nova.* The Maſter hath brought me Two Shells from that Country, hitherto not ſufficiently known, which he found on the Sea ſide, and I make bold to ſend you the Draught of them, the Shells themſelves being twice as long and broad as the Draught, and indeed I could not beſtow them better, than to one who hath the beſt Knowledge of theſe, and all other Sea Products.

On this Voyage nothing hath been diſcovered which can be any way ſerviceable to the Company. The Soil of this Country hath been found very barren, and as a Deſart; no Freſh-water Rivers have been found, but ſome Salt-water Rivers, as alſo no Four-footed Beaſts, except one as great as a Dog, with long Ears, living in the Water as well as on the Land.

Black Swans, Parrots, and many Sea-Cows were found there; as alſo a Lake, whoſe Water ſeemed to be Red, becauſe of the Redneſs of the Bottom of it: and round along the Shore there was ſome Salt. Our People had ſeen but Twelve of the Natives, all as black as Pitch, and ſtark naked, ſo terrified, that it was impoſſible to bring them to Converſation, or a Meeting: They lodge themſelves as the Hottentots, in Pavilions of ſmall Bran-

ches of Trees. By Night our People saw Fires all over the Country; but when they drew near, the Natives were fled. The Coast is very low, but the Country far from the Sea is high.

Upon the Island near the Coast have been seen Rats as great as Cats, in an innumerable Quantity; all which had a kind of a Bag or Purse hanging from the Throat upon the Breast downwards. There were found many well-smelling Trees, and out of their Wood is to be drawn Oyl smelling as a Rose, but for the rest they are small and miserable Trees. There were also found some Birds nests of a prodigious greatness, so that Six Men could not, by stretching out their Arms, encompass One of them; but the Fowls were not to be found.

There was great Store of Oysters, Lobsters, and Crabs; as also of strange sorts of Fish.

There were also Millions of Flies, very much troubling Men. They saw a great many Footsteps of Men and Children, but all of an ordinary bigness. The Coast is very foul and full of Rocks.

The Subject of this Voyage was to get Intelligence of a Ship having on board Sir *James Couper*, with Three Hundred Men, which we thought to be stranded there; but since we have understood that the said Ship hath been taken by some Pirates near *Madagascar*, and that the said Sir *James* was by them killed.

Amst. 3 *Oct.* 1698.

The Two Shells herein mentioned, are Printed in my Synopsis Conchyliorum, *the one is the* 1st Nautilus, *the other the* Concha Persica claviculâ radiatâ.

IV. *Some*

IV. *Some Philoſophical Experiments, communicated by the Right Honourable Sir* Robert Southwell, *V. P. R. S.*

1. *To make the Globe Looking-glaſs.*

TAke Quickſilver, Marchaſite of Silver, each Three Ounces, Tin and Lead, each half an Ounce; theſe Two firſt throw on the Marchaſite, and laſt of all the Quickſilver, ſtir them well together, but they muſt be taken from the Fire, and be towards cooling before the Quickſilver be added; let your Glaſs be well warmed, then pour out the Mixture, and roll it from ſide to ſide.

Note, This will do alſo when cold, but 'tis beſt when the Glaſs is heated and very dry.

Note alſo, That if at the Glaſs Houſe, your Ball be of Yellow Glaſs, then all will ſhine like Gold.

2. *To Paint a Globe-Glaſs, or any other, in Marble Colour.*

FIrſt grind well upon a Stone ſome Minium for Red.
2. *Radix Curcumæ*, or rather *Ceruſſa Citrina* for Yellow.
3. Smalt for Blew.
4. Verdegreaſe for Green.
5. *Ceruſſe*, or Chalk, for White.

Which being all ſeparately wrought in Oyl, take a Bruſh of Hogs Hair, mix in any of the ſaid Colours, and it will, being rowled in your Hand, ſcatter the ſame upon the Glaſs; then with your Pencil work them together as you think fit; and laſtly, fling a little Meade amongſt them, which covers all.

3. *The Magick Lanthorn.*

THere are every where made of theſe Lanthorns to repreſent and magnifie Figures upon a Wall, but then 'tis only in the Dark, wherefore to give Variety of Colours,

Take Oyl of Spike, and therein mix the ſeveral Colours, wherewith you will have your Glaſs to be ſtain'd, paint them finely on, they dry preſently, and penetrate any Glaſs.

4. *Phoſphorus*

4. *Phoſphorus Metallorum.*

TAke *Lapis Smaragdi Mineralis* (ſuch as is found in the Mines of *Saxony*) and beat it into a very fine Powder.

If you ſtrew this very fine on any Metal, and in any Figure, and ſet the Plate on any hot Coals, in a ſhort time you will perceive in the Dark, a Light to ſhine, which will (ſaith my Author) laſt as long as you continue the hot Coals, and if you beat out the Fire, it may do again for once or twice, but then the Vertue will fade.

V. *Part of Two Letters from Dr.* Cay, *to Dr.* Martin Liſter, *Fellow of the Colledge of Phyſicians and Royal Society; concerning ſome Mineral Waters.*

I Had a Mineral Water ſent me, not long ſince, by Mr. *Duncan* (a Surgeon in *Alnſeick*, pretty well known for his Skill in his own Profeſſion) which he deſired me to examine, and give him an account of. Accordingly I firſt try'd it after the uſual manner, with Galls, and found it turn'd almoſt quite Black, though it had been brought at leaſt Thirty Miles by Land-carriage from *Eglingham* in *Northumberland:* But if this deep Colour was ſomewhat of a Surprize to me (for it was deeper than that of any atramentous Water, I had ever met with before) yet you'll eaſily imagine, that I was much more ſurpriz'd to find, after I had ſlowly, in a Glaſs, evaporated more than one half of this Water, that

it

it ſtill retain'd the ſame atramentous Quality, and ſtruck yet as deep with Galls as ever. The ſtrangeneſs of this Phœnomenon made me hope to meet with ſomewhat new and uncommon in this Water; and the Event did not deceive me, for it yielded me, at laſt, a real and genuine Vitriol. I ſay nothing of the Ocre which this Water let fall in very great Plenty, that being a thing common to all atramentous Waters.

It's ſtrange, how the Thoughts of having found out ſome new thing, that has eſcap'd the Eyes and Obſervations of all Mankind beſides, does ſooth the Vanity of our Natures: The Appearance of a new Phœnomenon makes us think of nothing but ſetting up for Authors of ſome new Hypotheſis, and while we give not our Thoughts time to cool, and calmly to deliberate, we over-look a great many things, which, in cold Blood, we would have thought neceſſary to have been enquired after; and thus in our Haſte and Tranſport, for the moſt part, we loſe our ſelves, and leap over the Truth.

Though I was as ready as others to congratulate my ſelf for having met with a thing that ſeemed odd enough, yet I had ſtill ſome ſecret Suſpicions of this Matter, that kept me from confidently affirming that I had met with a Spring that held real Vitriol: I could not bring my ſelf to think it poſſible, that the Pyrites, lying conſtantly under Water, ſhould ever yield Vitriol; and I knew of nothing elſe (at leaſt in *England*) that I could expect it from: And for the *Miſi*, *Sory*, *Chalcites*, and *Melanteria* (of ſome of which Vitriol is made in other parts of the World, as *Agricola*, *Caneparius*, and others inform us) though the Account we have of 'em from the Ancients is very much confus'd, and ſometimes ſeems to be inconſiſtent, and what the Moderns ſay in this matter is but an imperfect Tranſcript of what the Ancients have ſaid before, yet if any thing can be gathered out of their Accounts

Accounts of these Stones, it seems to me to be this, that they are all but different sorts of the *Pyrites*: But if I be mistaken in this Matter, I desire that you would set me right, and inform me better. But however this may be, though these things had their weight with me, yet another thing seemed still to increase my Suspicions; I I could scarce bring my self to believe that a thing of this Nature, should not only escape your Observation, but the united Observations of the Gentlemen of the *Royal Academy* in *France*; and that after all, That, which could neither be found by you in *England*, nor by them in *France*, should so nicely reserve it self, only to be discovered at last by Dr. *Leigh* in *Lancashire*, and by me in *Northumberland*. But to put an end to all doubting in this Matter, having lately some Business that call'd me within Four or Five Miles of *Eglingham*, my Curiosity led me to visit this notable Well; and as I am too much a Friend to Dr. *Lister*, and the Truth, to conceal any thing that I saw; so, to tell the whole Matter, I found our mighty Rarity, our Vitriol-Water to be only an old Drift made for the draining of a Row of old-wrought Coal-Pits a little above, and I inform'd my self from some old Men, that had formerly wrought in these Pits, that there was plenty of the Pyrites there, by them call'd, Brass Lumps; and that this Drift was sometimes dry, and sometimes run with a plentiful Stream; which is as fair and full an Account how this Water comes to have Vitriol in it, as any one need to desire: If this, after all, must be reckon'd a Spring, we have yet a Variety of Medicated Springs, which Dr. *Leigh* takes no notice of, in *Lancashire*. Our Common Shores are sometimes strongly enough impregnated with Volatile Salt, to give Name to a new *Classis* of Urinous Springs; and it's to be wonder'd that *Kircher* reckon'd not the *Cloaca maxima* of *Rome*, among the medicated Springs of *Italy*. So much

am

am I of your Opinion in this thing, That this is (as you handsomly call these Places in your *Dissertation de Diabete*) only *Fons per accidens, & Sentina sive Cloaca potius quam Fons medicatus appellanda.*

New-castle, April 29. 1698.

The Second Letter.

IN my last I gave you an Account of a Water taken up near *Eglingham* in *Northumberland*, which holds real Vitriol, which nevertheless shakes nothing that you have said concerning the Pyrites, since 'tis no Spring but a Current of Water that runs through a Coal-Drift, and that sometimes with so small and low a Stream, that the Pyrites (which abounds in most Coal-Pits, but particularly in these) has leave to lye dry above Water and to germinate, till a wet Season brings down a more plentiful Run of Water, and washes all away along with it. I told you likewise that I suspected the *Fons Vitriolaceus*, near *Haigh* in *Lancashire*, to be much what such another Water, and find I was not much mistaken, for having been there lately, and made very particular Enquiry into the Matter I do assure you, that it is only a Spring which rises in a Coal-Drift (or Water-Level made for the draining of the Cannel Coal-Pits) which is so mix'd with the Coal-Water, that it's next to an Impossibility to separate 'em: So that it's no great Wonder if such a Water should yield Vitriol, as many of our Coal-Waters do: though why such sort of Drains should not rather pass for Common-shores (as you handsomly call 'em) than Medicated Springs, I see not; and think the Gentleman who was Godfather to this, might with as good Reason

reckon

reckon the *Cloaca maxima* of *Rome*, among the Medicated Waters of *Italy*.

That he has a peculiar Way of multiplying medicated Springs, you'll believe, when I tell you that he reckons one Water among his *Lancaſhire Fontes Medicati*, which neither is medicated, nor ſo much as a Spring at all; but, as I remember, (for 'tis near Five Years ſince I ſaw it) a meer Day-Water, that has no other Spring nor Supply, but immediately from the Clouds.

The Water which I mean is, his *Fons Sulphureus* near *Wiggan*, which (becauſe of its catching Fire at a lighted Candle) he calls by the Name of *Phoſphorus Aquaticus*: (though after all, it is not the Water but a *Halitus* which breaks out at the Bottom of the Hole, after moſt of the Water, or all the Water is thrown out, which catches Fire.) But this is much ſuch a *Fons Sulphureus*, as his Water near *Boulton* is a *Fons Vitriolaceus*, *i. e. ſine Sulphure*, as the other is *ſine Vitriolo*. Only with this notable Difference, that the Ochre of the *Boulton* Waters will, after it has been expos'd ſome time to the Air, yield (as the Ochre of all Atramentous Waters does) ſome little Vitriol; but this Water, whether expos'd to Fire or Air, will ſooner yield Maggots than Brimſtone.

But now to let you ſee that neither *Boulton* nor *Lancaſhire* are the only Places that produce Wonders, he takes a ſtep into *Derbyſhire*, and diſcovers more Wonders there, than ever were thought to be in the *Peak* before; he finds a Rock there near *Buxton*, which yields Vitriol, where not one Grain of the Pyrites is to be found. Any one that deſign'd to write with either the Exactneſs or Sincerity of a Philoſopher, would here have given us ſome Deſcription of this Rock; but that it ſeems we muſt not expect from this Gentleman; he contents himſelf with bare calling it a Rock, and tells us its Pariſh, and then he has done: I

enquir'd diligently after this Rock, when I was lately at *Buxton*, and was directed to a Place close by the Brook-side, within Three or Fourscore Yards of the House where the Bath is, where I found this Rock to be an Out-burst of Allom-stone, it falls in the Air from some little Mixture of the Pyrites, and has in some Places a Copperose Taste pretty strong; but that is no more than what I have found, and you first observed, in the Allom-rocks at *Whitby* and *Gisburgh* in *Yorkshire*. I need not, I know, tell you, how considerable a Quantity of Sulphur may be had from the Allom-Rock, nor how uncapable Sulphur is of producing a Vitriol that will strike Black with Galls, without Iron: at least, I know no Mettal that will do it, unless perhaps Gold, (which has several Properties common with Iron) and yet, I believe, the Doctor himself, would no more suspect this Rock of his to hold Gold than Diamonds; and if he allow Sulphur and Iron to be mix'd with this *Aluminis Minera*, it is but needless wrangling to deny the Presence of the Pyrites, where he allows its Principles.

New-castle, October 14. 1698.

VI. *Ex-*

VI. *Excerpta ex literis D. Cassini ad P. Fontenay Mathematicum Regium apud Sinas.*

QUÆ circa tuam observationem Mercurii in Sole Cantone habitam meditatus eram, videre potuisti in Academiæ Regiæ Commentariis, 15 Maii, 1693. editis: Ejus non nisi imperfectum nactus fueram exemplar quod R. P. Gouye aliundè fuerat communicatum, quale ab ipso inter alias observationes anno 1692. editum est, in quo perperam annotatus fuerat ingressus Mercurii in Sole, qui minimè observatus fuerat; ut deinde ex correcto exemplari quod post triennium a P. le Comte qui tecum huic observationi operam dederat allatum est, certior factus sum.

Eo tamen ingressu minimè usus fueram in re Geographica quando differentiam longitudinum Cantonem inter & Parisios horarum 7 23′ deduxi, ex exitu Mercurii ex Solis disco Cantoni & Norimbergæ observato, & ex Eclipsibus Lunæ observatis Norimbergæ & Parisiis. Itaque stat adhuc quam inde deduxi meridianorum differentia. Reformandi autem fuere calculi Astronomici deducti ex hypothesi ingressus Mercurii quod præstiti comparatione diversarum phasium quarum observationes, in priori exemplari fuerant omissæ. Inter quas selectis iis quæ magis invicem salvis Astronomicis hypothesibus ab omnibus receptis congruere videbantur, ex iis invicem comparatis Mercurium medium viæ ipsius in sole tenuisse reperi hora 1 26 minutis post meridiem, totamque ipsius moram in Sole fuisse horarum 3 43′ circiter. Quin etiam nodum Mercurii ascendentem ex his phasibus invicem comparatis inveni in gr. 14 32′ Tauri, qui ex falsâ ingressus annotatione horâ ferme integra verum postponente in gr. 13 8′ ejusdem signi proveniebat.

Evaneſcit igitur ſuſpicio retrogradationis nodorum Mercurii oborta ex comparatione calculi falſæ huic annotationi ſuperſtructi cum eo quem circa obſervationes D. Hallei, & D. Gallet anni 1677. habueram, unde nodus hic in gr. 14 9′ Tauri mihi provenerat. Quin potius motus nodi Mercurii in ſignorum conſequentiâ ex hâc comparatione deducitur, quamvis ob ingentem difficultatem loca nodorum ad minutum determinandi ex hac differentiâ tam brevi temporis intervallo, motus nodorum annuus haud tutò poſſit determinari.

Inclinationem orbitæ Mercurii ad eclipticam ex his obſervationibus deduxi gr. 6 40′ propiùs accedentem ad tabulas Rudolphinas.

Nobis feliciter obtigit Mercurium in Sole conſpicere in obſervatorio Regio Pariſienſi die 3 Novembris N. S. exeuntis anni 1697. fermè per tres horæ quadrantes. Obſervatarum à nobis Phaſium ſelectiſſimæ in compendium redactæ ejuſmodi ſunt.

Hora 7 23′ cum Sol è nubibus quæ horizontem obſederant emerſiſſet, directo ad ipſum Teleſcopio H. 7. 25′ differentia aſcenſionis rectæ centri Mercurii Occidentalis & centri Solis obſervata per horologium fuit horarum

	0	11′	52″
Differentia declinationis Mercurii Meridionalis fuit gr.	0	6′	20″
Horâ 8. 3′ differentia aſcenſionis rectæ centrorum Mercurii occidentalis & Solis fuit horarum	0	15′	30″
Differentia declinationis graduum	0	4′	42″

Horâ 8. 8′ 38″ margo præcedens Mercurii pervenit ad Solis marginem præcedentem

Horâ 8. 10′ 24″. Mercurius totus emerſit è ſolis diſco Teleſcopio pedum 18 obſervatus.

Ex

Ex his obſervationibus invicem comparatis quantum ex hoc brevi intervallo inferri potuit adventum Mercurii ad medium ipſius ſemitæ in ſolis diſco Trigonometricè deduxi hora 6. 11′ 18″. poſt meridiem.

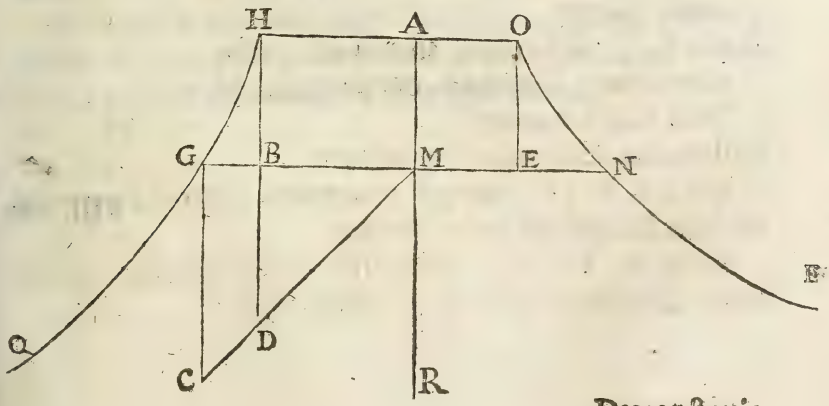
Nodum verò aſcendentem Mercurii in ☌ 14 42′. adhuc promotiorem quam per obſervationes anni 1677.

Inclinationem autem orbitæ Mercurii ad Eclipticam ex poſtremarum obſervationum comparatione inveni gr. 6. 23. quam nihilominus ob breve harum obſervationum intervallum præferre non auſim ei quam ex veſtris Sinenſibus obſervationibus longè majori intervallo diſtantibus deduxi.

VII. *Quadratura Logarithmicæ. Autore Jo. Craig.*

ESTO ONF Curva Logarithmica, cujus Aſymptotos AR, in qua tale ſumatur punctum A, ut ejus prima ordinata AO ſit ſubtangenti ſeu unitati æqualis: Quæritur ſpatium curvilineum AONM a duabus ordinatis AO, MN; abſciſsâ AM, & Curvâ Logarithmicâ ON comprehenſum.

Ex O ducatur OE ad AM parallela & ſecans MN in E; Dico quod rectangulum ex ſegmentis ME, EN ſit æquale ſpatio quæſito.



Demonſtratio.

Demonſtratio. Vocetur Ordinata MN, Z; ſubtangens AO ſeu ME, s: & ad axem AR conſtruatur alia Curva HGE, cujus æquatio $2sz = x^2$, ubi ejus ordinata GM = x; dico quod ſit quadratrix Logarithmicæ juxta methodi meæ fundamentum; ſcil. ejus ſubnormalis eſt reſpectivæ hujus Ordinatæ æqualis: ut ex calculo iſtius methodi patebit: Ergo (juxta alibi à me expoſita) ſi ad G ducatur GC perpendicularis & æqualis lineæ GM, nec non HD parallela ad GC, & lineis GM, CM occurrens in B & D; erit trapezium GBDC = AONM. Sed GBDC = GMC — BMD = $\frac{1}{2}x^2 - \frac{1}{2}$ BMq = SZ — $\frac{1}{2}$ HAq; ſed HA = $\sqrt{2}$ AOq ex natura Curvæ HGQ, ergo GBDC = SZ — AOq = AO x $\overline{MN}$ — AOq = AO x MN — AO = ME x $\overline{MN}$ — $\overline{ME}$ = ME x EN; Ergo etiam AONM = ME x EN. Q. E. D.

Cum Methodum meam meam ad hujuſmodi Figuras applicarem; inveni Errorem aliquomodo in Calculum Bernoulianum irrepſiſſe, dum figuræ cujus æquatio $a^z = y^y$ Quadraturam aſſignat $\frac{2yyly - yy}{la}$ in pereximio ſuo Tractatu — De principiis Calculi Exponentialis; eſt enim iſtius figuræ, Area = $\frac{2yyly - yy}{4la}$; ubi y abſciſſam & z ordinatam deſignat.

VIII. *An*

VIII. *An Account of a Gall-Bee, and the Death-Watch. By Mr.* Benj. Allen.

The Gall-Bee.

IN thoſe Galls which came to me by the Name of *Aleppo-Galls*, which the Inſects had not eat their Way out of, I found one ſort of Bee, reſembling the ſmall ſort of our wild Bees which Earth; they have long Wings, a deep Belly, and on the Back near the Comiſſure to the Body, it is of a greeniſh black, the reſt reddiſh, near a Cinnamon Colour, the Belly thick and deep.

Theſe Galls were very gummy, and the Cavity round them was ſo extreamly gummy, that not the leaſt room or entrance of it appeared, though the Bee was beginning to make its way out. Some of the Galls had a Stem to them, and may give ſome Light to the reaſon of Life, that the Atmoſpherical Air is not neceſſary to the Eſſence, before the Organs of the Body are employ'd; but that that is maintain'd by a ſubtiller Air, that pervades more minute Pores, as it is conveyed to Fiſh through the Water, *&c.* *Vide* Figure 1.

But this is not the only Inſect that I have found in Galls, for the greyer ſort, not ſo rich in Gum: I have found a ſmall *Ichneumon* of a bright Green.

An

An Account of the Scarabæus Galeatus Pulsator, *or the Death-Watch*; *taken* August. 1695. *by Mr.* Benjamin Allen.

THe Second Animal I observ'd (*Vid. Fig.* 2, 3, 4.) is a Death-Watch; I have taken some before this, it is that which makes a Noise resembling exactly that of a Watch; it is faithfully the very same, and liv'd Four Days with me, beating exactly, for I took two, I suppose one was the Female, that is only Conjecture.

I took one some Years since, which I then trac'd by the Noise, as I did this, and were both the same; I shew'd it to Mr. *Ray* while it was alive and did beat.

This small Beetle, which makes a Ticking or distinct Beating, resembling the Noise of a Watch, being rarely heard, and not known, has obtain'd the Name of a Death-Watch, which yet I have known to be heard by many, where no mortality follow'd; and particularly by my self, who have taken Two of the same, Seven Years since, without any Death following that Year.

This Beetle I found in a Copper Body, it resembled dry Dirt in Colour. I found another, some Years before, on a rotten Post; and made the Noise like a Watch, by beating its Head on the Subject that it finds fit for Sound, this found in *August*, 1695. had another answer'd it in the same Room, and after a Minute's distinct Beating, would forbear for the other to answer; which the other single one would not; though that would make some Breaks now and then. The Part it beats with is, the extream Edge of the Face, which I may call the Upper-Lip, the Mouth being protected by this Bony Part, and lying underneath, out of view.

It

It was Two Lines and a half long (calling a Line the eighth part of an Inch) the Colour a dark brown, with Spots, ſome lighter, irregularly plac'd, which would not rub off readily. They ſeem'd to lye rather athwart the Back, and direct on the Head; as in the ſmall Figure, which is much of the ſame Size with it, and the *Maculæ* are deſign'd for the greyiſh Spots. Under the *Vaginæ* are the pellucid Wings, and the Body is of a Pullous Colour. The Head appear'd large, by reaſon of a large Cap or Helmet which cover'd it round, only at the Ear turn'd up a little; from under this appeared the Head, which was flat and thin; The Eyes forwards; the Lip hard and ſhining; the Ears of the Helmet greyiſh. Two *Antennæ* proceeded from under the Eyes, which, by their meeting on the Breſt, I conjectured to aſſiſt their Feeding, and to be rather Proboſces; and the Helmet to be turn'd up for Hearing-ſake, and the Belly plicated as other Beetles.

The other Beetle that anſwered it was leſs, and the Marks on the Back not ſo diſtinct.

By the Microſcope I diſcovered the Marks to be thick-ſet Spots of Hair, of a Caſtor Colour; the Head all hairy, and Face thick of curl'd Hair. On the Belly was a little but thin ſet Hair. The Eyes appeared large, as in the Figure, The Superficies conſiſting of many ſmall Squares furrowed deep between, and theſe lay in Lines tranſverſly deſcending toward the Noſe: Theſe Eyes were not movable but contiguous to the Face without any Cavity to receive them; and they were very opake. The *Antennæ* proceeded from under the Eyes; the firſt large Joynt having a Cavity, out of which it proceeds at the ſides of the Lip. Between the Eyes the Face riſes in a little Ridge, which is the Noſe, and is ſignified by the light part of the Face under this crooked Line which is made by the Shade of the Noſe that protuberates under it. And juſt below the Noſtrils are cover'd by ſtrait

pendulous Hair, proceeding from the lower Ridge of the Nose: Under this Hair the Cavity is dark: Below the Nose the Lip-shades shew the more depress places: Under this Lip are visible four Forcipes to lay hold on its Food, two of each side, as in the Figure.

See the Figures, the largest of which is drawn with the help of a Microscope.

IX. *An extract of a Letter from Dr.* Robert St. Clair, *to Dr.* Rob. Hook, *F. R. S. giving an Account of a very odd Eruption of Fire out of a Spot in the Earth near* Fierenzola *in* Italy, *with an easy Contrivance of a Lamp to be kept always full whilst it burns.*

SIR,

HAving lately had an Observation communicated to me by my Brother, which he made when he travelled through *Italy* last, differing from any I have hitherto met with in Natural Histories, I presume you may think it not unfit to be communicated to the Publick, and so give it a Place in the next *Philosophical Transactions.* It is this: On a side of one of the *Appenine* Mountains half way betwixt *Bologna* and *Florence*, near a Place called *Petra Mala*, about Five Miles from *Fierenzola*, there is a Spot of Ground about three or four Miles diameter, which incessantly sends up a Flame rising very high, without Noise, Smoke or Smell; yet it gives a very great Heat, and it has been observed to be thus in all times, except of great Rains, which put it out for a time; but when that is over it burns with greater Vigour and Heat than before: the Sand about it, when turn'd

turn'd up, ſends up a Flame; but within three or four Yards of it there grows Corn all round about; for it continues always in the ſame Spot. This Flame ſeems to proceed from a Vein of Bitumen or *Naphtha* that *cropes* (as the Miners call it) only here; which, when by plowing, or ſome other Accident, the upper Cruſt has been turn'd up, was kindled into a Flame by the Heat and Agitation of the Air, as other *Salino-Sulphureous* Bodies are, of which Eſquire *Boyl*'s *Phoſphorus* is a particular Inſtance, the like ſpontaneous Accenſion is ſeen in many mineral Subſtances, but none that I know of, ſo quick in its production or laſting, as this is, the whole Woods and Fields have been deſtroyed by them. The Neighbours there have been ſo little curious to obſerve it, that they believed that there was a great Hole in the Flame-place; but he found it to be firm Ground. Neither does any there remember when, and upon what Occaſion it firſt began. The flaming Well near *Wigan* ſeems to proceed from a Cauſe much like this, in which you may boyl an Egg, and upon the approaching of a lighted Candle it takes Fire, both ſeem to proceed from a *Naphtha* or ſubtle *Bitumen*, only that in a hotter Country, and being in a dryer Soyl, is more Subtle and inflammable; juſt as the *Petroleum* which is found in *Italy* is a white-like Spirit of Turpentine; and is more penetrating than the *Petroleum* which is to be found in the Northern Countries; an Inſtance of which we have in a Well two Miles diſtant from *Edinburgh*, called the *Baulme-Well*, of a black red colour, and very thick, but being diſtill'd, does in Colour, Taſte and Smell, reſemble that of *Italy*. What *Lonicerus* ſays of the *Naphtha* is not improper for this Place, *viz.* that 'tis of two ſorts, *Candida & Nigra, Candida præfertur; generatur ex bitumine à ſeipſo in terrâ & montibus accenſo, tenuiſſimis ejus vaporibus ſurſum elatis, & ad frigidora ſaxa in tenuem li-*

quorem reſolutis, quæ per ſuos meatus è montibus fontium inſtar ſcaturit, ac inde oleum petræ dictum eſt, quod videlicet ex petris profluat. This ſpontaneous Accenſion of the *Naphtha* ſeems to be made out by the Smell that our *Bitumen* near *Edenburgh* yields, being moſt like Coal-Smoak. There are three ſuch Fires on the ſame Hills that are extinguiſht in the Summer, but burn in the Winter. The Reaſon of which I judge to be, that the Bowels of the Earth being cooler in Summer than in Winter, do not ſend forth that Quantity of thoſe ſubtile Exhalations as may be ſufficient to maintain a Flame in Summer; but in Winter, the Bowels of the Earth being hotter (which is made evident by the ſmoaking of Springs in Winter, and not in Summer, and the Experience of Miners) greater Plenty of Steams are ſent forth, which in the Air are agitated into a Flame, the brisk of the Parts one againſt another, being promoted by the ſubtilty and brisk Motion of the Aerial Particles, *quæ mutuas dant operas.*

An eaſy Contrivance of a Lamp to be kept always full whilſt it burns.

SIR,

MY writing of this Accenſion of combuſtible Matter by the Air, puts me in mind of your Obſervation about the Action of Flame, upon the Wyck of a Lamp or Candle, which it never waſtes till the Wyck be expos'd to the Air by the Flames falling downwards, from which you infer, that a way found out to keep the Fuel, and conſequently the Flame at the ſame height upon the Wyck, would make it ſerve a long time; for which effecting, you have a great many pretty Contrivances. I have, a good while ago, thought the ſame might

might be effected by Hydroſtaticks; which when I firſt communicated, was approved of; and I am thereby induced to think it will not be unacceptable to the Publick. It is this; Let a Lamp be made Two or Three Inches deep, with a Pipe coming from the bottom, almoſt as high as the top of the Veſſel, be fill'd firſt with Water, ſo high as to cover the Hole of the Pipe at the bottom, to the end the Oyl may not get in at the Pipe (and ſo be loſt): then let the Oyl be pour'd in ſo as to fill the Veſſel almoſt brim full, which muſt have a Cover pierct with as many Holes as are deſign'd to be Wycks. When the Veſſel is thus fill'd, and the Wycks are lighted, if Water fall in by Drops at the Pipe, it will keep the Oyl always at the ſame height, or very near, (the Weight of Water to that of Oyl being, according to *Kircher*'s Table, as $20\frac{8}{11}$ to 19, which in two or three Inches will make no conſiderable difference.) If the Water runs faſter than the Oyl waſtes, it will only run over at the Top of the Pipe, what does not run over, will come under the Oyl, and keep it to the ſame height.

2. *To*

X. *A Copy of a Letter from* R. P. *Vicar of* Kildwick *in* Yorkſhire, *to a Friend of his in thoſe Parts, wherein he gives an Account of an Extraordinary Eruption of Water, which happened in* June, 1686.

Worthy Sir,

I Have now drawn a full, though ſhort, Account of the great Loſs ſuſtained by the Inhabitants of *Kettlewell* and *Starbotton*, in *Craven*, in the County of *York*; by a ſudden overflow of Water. The Towns are ſituate under a great Hill on the Eaſt and Weſt; the Country is very mountainous and Rocky. The Deſcent of the Rain was after a Thunder-Clap, for the Continuance of about an Hour and half, with extraordinary Violence, and by ſeveral Eye-witneſſes, the Rock on the Eaſt ſide opened viſibly, and Water they beheld thence into the Air, the height of an ordinary Church-Steeple; ſo that the Current of Water came down the Hill into the reſpective Towns, as in one entire Body, and with a Breaſt as if it would have drowned the whole Towns. Several Houſes were quite demoliſhed, and not a Stone left; others gravel'd to the Chamber-Windows; ſome Inhabitants driven, until this Day, from their Habitations, the Current of the Water running through their Houſes; mighty Rocks deſcended from the Mountains into the Valley, and there lie immovable; many fair Meadows cover'd with Sand and Stones, that the Worth of the Soil will not regain the ſame. Houſhold-goods taken away into the great River of *Wharfe*, and

ſo

ſo loſt; beſides many quick Goods. The loſs reputed to be many Thouſand Pounds. Many Families quite ruined; others in part only. Such an Inſtance hath not been heard of within Memory, conſidering all Circumſtances. Much more might be ſaid; but, in ſhort, this may ſatisfy as an intelligible Account of what you requeſted from,

YOUR FRIEND,

R. P.

Since the firſt Flood that I have related, there have been Two others, though not ſo great and dangerous: For the Towns have either of them a great Beck (as we call it) or Current of Water runing through them, which by the firſt Flood were gravel'd up; ſo that the Paſſage is much altered, and cannot be regained; though there have been many Hundreds of Men ſet to do it, and Hundreds of a Day.

XI. *Some Experiments about Freezing. By Mr.* Deſmaſters. *Communicated by Dr.* William Muſgrave, *Fell. Coll. Phyſ. and R. S.*

A Tube of $\frac{1}{4}$ of an Inch Diameter being fill'd with Water to the height of two Inches, and ſet to freeze in a Mixture of Snow and Salt, the Water, when perfectly frozen, appear'd $\frac{1}{16}$ of an Inch, above the Mark it ſtood at before freezing.

Another Tube, of almoſt an Inch Diameter, being fill'd with Water to the height of Six Inches, and ſet to freeze, as before, roſe $\frac{7}{8}$ of an Inch above the Mark.

It was obſervable, that when the Water thus ſet in Snow and Salt began to freeze, a great many ſmall Bubbles continually roſe from the Bottom.

XII. *A Catalogue of Electrical Bodies. By the late Dr.* Rob. Plot, *F. R. S.*

NOn ſolum Succinum & Gagates allectant corpuſcula, ſed & Adamas, Saphirus, Carbunculus, Iris gemma, Opalus, Amethiſtus, Pſeudo-adamas Briſtolienſis, Berillus & Chriſtallus: Item Hyacinthus, Granatus Bohemicus, Vitrum & ex vitro ſive Chryſtallo gemmæ adulteratæ, vitrum Antimonii & Saturni, omnes fluores ex fodinis, Belemnites, Sulphur, Maſtix, Cera ſigillaris ex lacca, Reſina durior, Arſenicum ſed imbecillius, & Cælo ſicco Sal gemmæ, Lapis Specularis, & Alumen rupeum.

XIII. *An*

XIII. *An Account of a Book.*

Hiſtoire des Plantes qui naiſſent aux environs de Paris avec leur uſage dans la medecine par M. Pitton Tournefort de l'Academie royale des Sciences, Docteur en Medecine de la faculte de Paris & profeſſeur en botanique au jardin royal des Plantes. A Paris de l'Imprimerie Royale 1698. 8vo.

THE Author of this Book is very well known to the Learned already by his Works formerly publiſhed; in this Book he gives an Account of the Plants growing wild about *Paris*. The Preface relates the Succeſs of ſeveral Experiments he made to diſcover the Salts contained in the Earth, wherein Plants grow, many of theſe were done with great Labour and Nicety. He likewiſe gives his Opinion of the ſeveral Ways of the Operation of Medicaments on humane Bodies, and of his Opinion of the Cauſes of the ſame.

The Book it ſelf is divided into Six Herboriſations, each of which contains the Plants he met with in the Courſe of the Walk he preſcribed to himſelf. To the Names he gives each Plant from the beſt and moſt common Authors, he adds a critical Account of the extant Deſcriptions and Figures of each, *viz.* Where it is ill, and where well deſcribed and figured. He gives farther, very often, an Account of the Chymical Analyſis of it, which he generally extracts from the Regiſters of the *Academie Royale*. He alſo gives an Account of the Vertues aſcribed to each Plant, from the moſt approved Authors, or from Information he received from the Inhabitants of ſeveral Countries he liv'd in, or travel'd through. There are ſo many new and obſervable things of uſe in this Book, the Curious, for full Satisfaction, muſt have recourſe to it themſelves.

XIV. *An Account of Books newly Printed beyond Sea.*

DIſſertatio Epiſtolaris altera triceps, circa Mercurii motiones in Barometro, in qua Clariſſ. Virorum, D. Rudolphi Jacobi Camerarii, P. D. Cajetani Fontanæ, & D. G. C. Schelhammeri Quæſita, Objecta, Cogitata, explentur, diluuntur, expenduntur à Franciſco Torto M. P. Ad Virum Ornatiſſimum & Amiciſſimum D. Bernardinum Ramazzinum, Pub. Med. Prof. & inter Acad. Nat. Curioſ. Hipp. III. Mutinæ, typis Bartolomæi Soliani, MDCXCVIII, in 4.

Franciſci Arioſti, de oleo Montis Zibinii, ſeu Petroleo agri Mutinenſis libellus, è MStis membranis editus ab Oligero Jacobæo, Hafniæ, 1690. Nunc autem ad fidem Codicis MS. ex Bibliotheca Eſtenſi recognitus, & recuſus, adjecta ejuſdem argumenti Epiſtola Bernardini Ramazzini, Profeſſ. Mutinenſis. Mutinæ, MDCXCVIII, in 12.

Specimen Mechanicum de Febribus, conſcriptum neceſſitati Equitum ruri degentium ſine medico, quorum gratia ſimplicia medicamenta proponuntur. Accedit pro Medicis Junioribus, juxta leges Mechanicas, idea Theoretico-practica de iis, quæ vel critice, vel ſymptomatice eveniunt in febribus, roborantur caſibus in epidemiis ab Hippocrate deſcriptis. Auctore Jo. Baptiſta Scaramucci, Primo Medico Urbini. *Hoc opus adhuc ſub prælo eſt.*

Joh. Chriſtiani Itteri de Honoribus ſive Gradibus Academicis liber. Francof. ad Mœnum apud Frid. Knochium, 1698. 4.

Mich. Bernardi Valentini Medicina Nov-Antiqua. Francof. ad Mœnum, apud. Jo. Dav. Zunnerum, 1698. 4.

Pharmacopée Univerſelle, contenant toutes les compoſi-

tions

tions de Pharmacie, leurs vertus, leurs doſes, &c. Par Nic. Lemery. A Paris, chez Laurent d'Houry, 1697. 4.

Le Threſor de la Medecine, contenant l'Anatomie des parties du Corps humain, les maladies auſquelles elles ſont ſujetes, les remedes ſpecifiques, &c. A Paris chez. Barth. Girin. 1697. 12.

Traité de Phyſique & de Chirurgie, par Jean Pontrailles. A Paris, chez la Veuve de Claude Thibouſt, 1697. 12.

Les Oeuvres d' Hipocrate traduites en Francois avec des remarques, & conferées ſur les Manuſcrits de la Bibliotheque du Roy. A Paris, par la Compagnie des Marchands, 1697.

Roſini Lentulii Miſcellanea Medico-Practica tripartita. Ulmæ apud G. W. Kuhun, 1698. 4.

Petri Poterii Opera omnia Practica & Chymica, cum Additamentis Friderici Hofmanni. Francof. ad Mœnum, apud Frid. Knochium, 1668. 4.

Caroli Muſitani Chirurgia Theocretico-Practica, ſeu Trutina Chirurgico-Phyſica. Coloniæ Allobrogum apud Cramerum & Perachon, 1698. 4.

Philoſophiæ Eclecticæ, h. e. exercitationum Academicarum Tomus II. Auctore Jo. Chriſtoph. Sturmio. Altorfii apud Jo. Wilhelmum Kohleſium, 1698. 8.

Jo. Jac. Franciſci Baſis univerſæ Medicinæ. Conſtantiæ ayud F. X. Straub, 1698. 8.

Joannis Clerici Opera Philoſophica in quatuor volumina digeſta. Amſtelod. apud Georg. Gallet, 1698. 8.

Dernieres Decouvertes dans l'Amarique Septentrionale de Monſier de la ſale, miſes au jour par Mr. le Chevalier Tonti. A Paris chez Jean Guignard, 1697. 12.

De l'Art de la Verriere, &c. La maniere de faire les Perles, &c. par Mr. Haudicquer de Blancourt. A Paris chez J. Jombert, 1697. 12.

De Nederlandſche Herbarius, ofte Kruidboek der voornaamſte Kruiden, &c. met kopere platen verciert door Steph. Blankaart. T' Amſterdam by Jan. Ten Hoorn, 1698.

XV. *An Account of Books now Printing beyond Sea.*

DR. *Volcamer* is Printing a Catalogue of the Plants about *Nurenberg*; with the Exoticks of his Garden, with Figures. Dr. *Baglivi*, at *Rome*, is Printing a Book *De Fibra Motrice, de Lympha & Pinguedine Morbisq; ab iis dependentibus.* Senr. *Bulifon* is Printing the Lives of the famous Men of the Kingdom of *Naples*, with their Effigies. *Abbate Maruſcelli*, as alſo a *French* Bookſeller, at *Rome*, are about writing an univerſal Catalogue of Books, *Secundum Materias*; the firſt, as he ſays, has already done above 140,000 Volumes. Monſig *Strozzi* is writing the Lives of the Popes; illuſtrated by their Medals. Signior *Abbate Nazari* is about re-printing the *Giornale de Letterati*.

Father *Plumier* will publiſh a Book called, *Filicetum Americanum.* Monſieur *Du Hamel*, Author of the *Philoſophical Syſteme*, has almoſt ended his Hiſtory of the *Academie Royale* of Sciences at *Paris.*

LONDON: Printed for *Sam Smith*, and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

Fig: 6 Philos: Transact: No: 246

Fig: 7

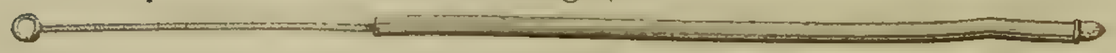


Fig: 8

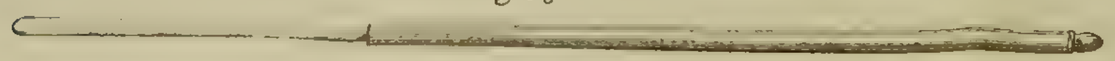


Fig: 9

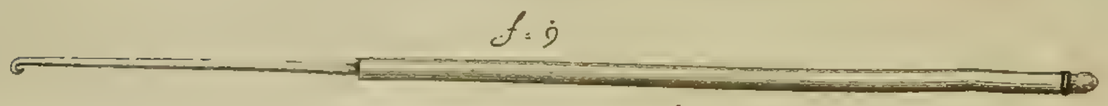


Fig: 10

Fig: 11

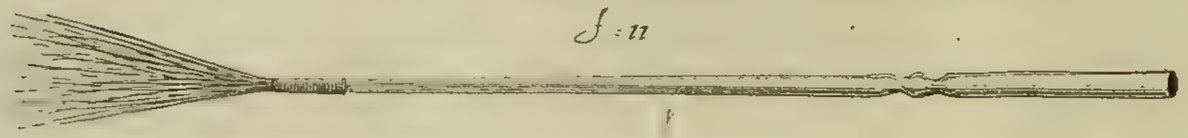


Fig: 12

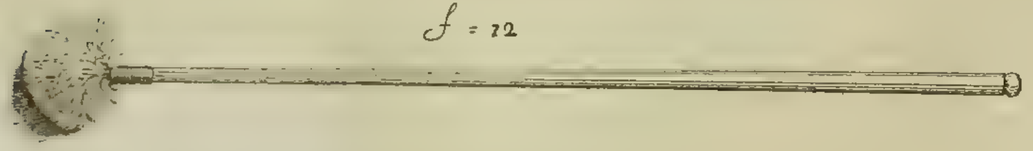


Fig: 13

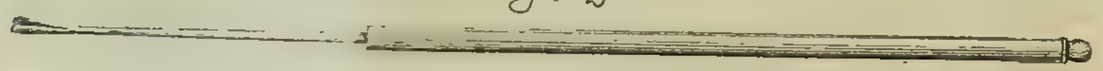


Fig: 1

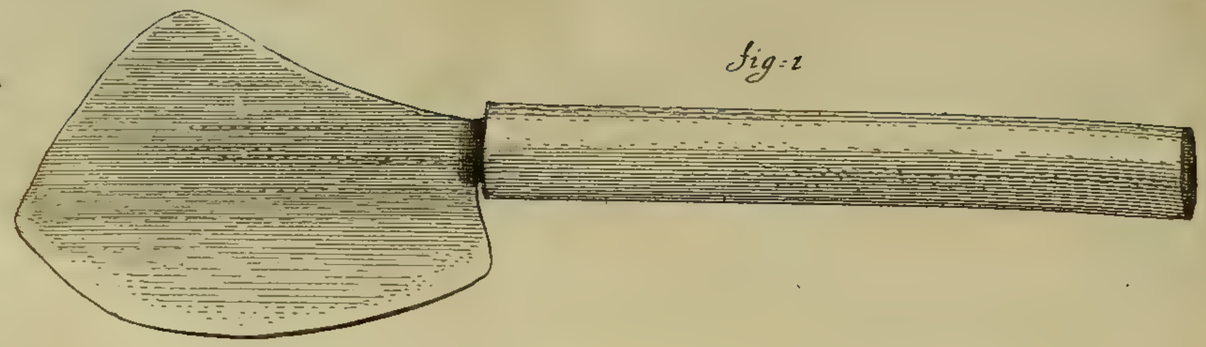
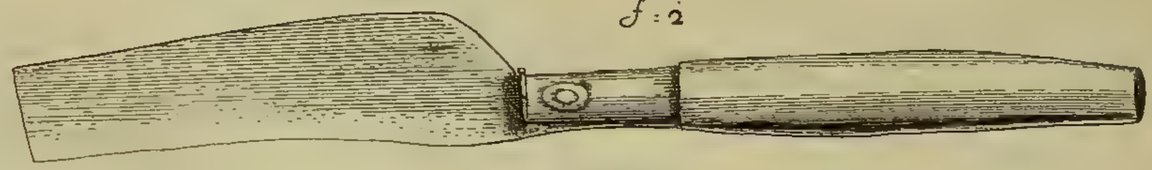


Fig: 2



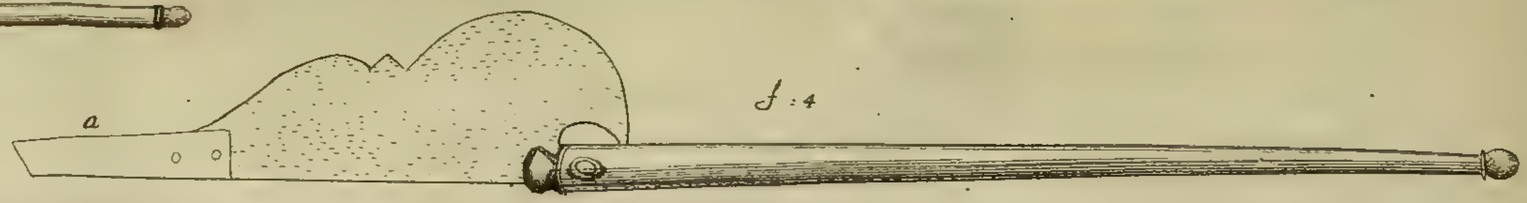


Fig: 4

Fig: 14

Fig: 5

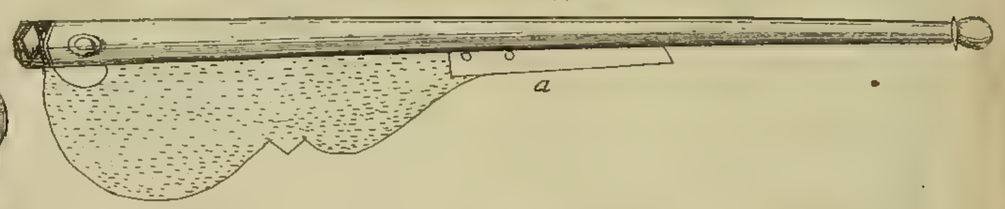
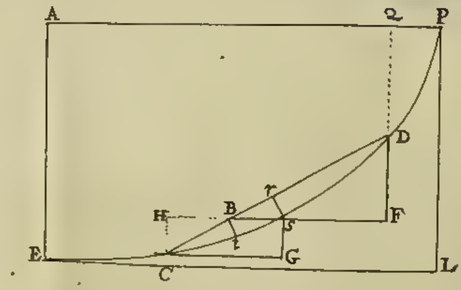


Fig: 3

Fig: 15



PHILOSOPHICAL TRANSACTIONS.

For the Month of November, 1698.

The CONTENTS.

I. *An Account of a* China *Cabinet, filled with several Instruments, Fruits,* &c. *used in* China; *sent to the Royal Society by Mr.* Buckly, *chief Surgeon at* Fort St. George. *By* Hans Sloane, *M. D.* II. *Remarks by Mr.* James Petiver, Apothecary, *and* Fellow of the Royal Society, *on some* Animals, Plants, &c. *sent to him from* Maryland, *by the Reverend Mr.* Hugh Jones. III. *Captain* Langford's *Observations of his own Experience upon Huricanes, and their Prognosticks. Communicated by Mr.* Bonavert. IV. *Concerning the Magnetism of Drills; by Mr.* Ballard. *Communicated by Dr.* William Musgrave, *Fellow of the Colledge of Physicians and R. S.* V. *Part of a Letter from the Reverend Mr.* George Lewis, *at* Fort St. George; *to the Reverend Dr.* Arthur Charlett, *and the*

late Dr. Edward Bernard; *concerning ſome Indian Manuſcripts, lately ſent to the Univerſity of* Oxford. VI. *An Account of what happened to a Child on ſwallowing Two Copper Farthings. Communicated by Dr.* Edward Baynard, *Fellow of the College of Phyſitians.* VII. Curvæ Celerrimi Deſcenſus *inveſtigatio Analytica excerpta ex literis R. Sault, Math. D°.*-------. VIII. *A Catalogue of Books lately printed in* Italy.

VII. *An Account of a* China *Cabinet, filled with ſeveral Inſtruments, Fruits,* &c. *uſed in* China: *ſent to the Royal Society by Mr.* Buckly, *chief Surgeon at* Fort St. George. *By* Hans Sloane, *M. D.*

MR. *Buckly,* chief Surgeon at *Fort St. George* in the *Eaſt-Indies*, having lately preſented the Royal Society with a *China* Cabinet, full of the Inſtruments and Simples uſed by their Surgeons, &c. amongſt which, ſeveral are new and of different Shapes from the ſame uſed in *Europe*, they have commanded me ſome Account ſhould be given of them.

The Raſors were of Two Sorts, either ſuch as are repreſented to the natural Bigneſs, *Fig.* 1. and reſemble ſome Sorts of Knives, and do not fold in; or

Fig. 2.

Fig. 2, and 3. which repreſent another ſort of Raſors, which are longer, and fold in after the manner expreſſed in the Figures. They were daubed over with a Subſtance reſembling *Diachylum* Plaiſter, to keep them from Ruſt, which it had effectually done, through different Climates.

Fig. 4. and 5. repreſent an Inciſion Kniſe uſed in *China*, the whole being of Braſs, excepting towards their Point *aa*, which is of Steel.

The moſt unuſual Inſtruments that came over in this Cabinet were, thoſe contrived for the taking any Subſtance out of the Ears, or for the ſcratching or tickling them, which the *Chineſe* do account one of the greateſt Pleaſures.

Fig. 6. Does repreſent one of theſe Inſtruments which is a ſmall Pearl, ſuch as is uſed in Necklaces, through the Bore of which is put and faſten'd a Hog's Briſtle, the other End of the Briſtle being faſt in a Tortoiſe-Shell-Handle.

Fig. 7. Repreſents an other Inſtrument for the Ears, made of ſmall Silver Wire twiſted, ſet into a Tortoſe-Shell-Handle, the Wire being made into a round Loop at the End.

Fig. 8. Shows an Ear Inſtrument made of a piece of large Silver Wire, flatted at end, and ſet in a piece of Tortoiſe-Shell.

Fig. 9. Is an Ear Inſtrument made likewiſe of Silver-Wire, ſet in a Tortoiſe-Shell-Handle, the End of the Wire being made ſharp, and ſhap'd like an Hook.

Fig. 10. Repreſents an Ear Inſtrument, very much reſembling our common *European* Ear-pickers, being of Silver ſet in Tortoiſe-Shell.

Fig. 11.

Fig. 11. Shews the Figure of an Ear Inſtrument made of ſeveral Hogs Briſtles, ſet as in a common Pencil.

Fig. 12. Repreſents Inſtruments made of very fine Downy Feathers tyed together like a Pencil, or Bruſh on the end of a Tortoiſe-Shell-Handle.

Fig. 13. Shows an Inſtrument exactly like that figured *Fig.* 8. only the flat end has a ſlit through it.

Fig. 14. Is a *Chineſe* Figure, wherein is repreſented one of that Nation, uſing one of theſe Inſtruments, and expreſſing great Satisfaction therein. This I had of *William Charleton*, Eſq; who favoured the Royal Society with a Sight of it at one of their Meetings.

Whatever Pleaſure the *Chineſe* may take in thus picking their Ears, I am certain moſt People in theſe parts who have their hearing impaired and have adviſed with me for their Help, I have found have had ſuch Misfortunes firſt come to them by picking their Ears too much, and thereby bringing Humours, or ulcerous Diſpoſitions in them.

II. *Remarks by* Mr. James Petiver, Apothecary, *and* Fellow of the Royal Society, *on some* Animals, Plants, &c. *sent to him from* Maryland, *by the Reverend* Mr. Hugh Jones.

SECT I.

Cruſtaceous Animals.

Teſtudo terreſtris Americana, *dorſo elato.* 1.

I do not find this certainly *deſcribed* by any Author. Its *Shell* an Inch and a quarter long, and one broad, the *Scales* about the Edges are *Quadrangular*, thoſe above *Pentangular*; he is guarded along the *Back* with a round Ridge; his Head about the Bigneſs of our *Horſe-bean*; the *Orbits* of the *Eyes* very large; his *Snowt* not very unlike a *Parrot's Bill*, his upper Jaw including the under; each *Foot* has four ſharp Claws like a *Mouſe*.

His *Belly* is made up of ſeveral thin *Scales*; whoſe middle Pair are *long* and *quadrangular*, that next the Head and Tail *triangular*, the reſt *irregular*; his *Tail* taper, and about half an Inch long.

His whole *Body* exceeds not the half of a large *Walnut*.

The Molucca Crab. 2.

Mus Regal. Soc. 120.

In *Virginia* and ſeveral parts of the Continent of *America*, they call it, *Synonyms.*

The King Crab.

Muſ. Tradeſc. 8.

Cluſ. *Exot.* 128. Laet. *Latin.* ---*Gallic.* 60 *Muſ.* Wor. 249. *Muſ.* Tradeſc. 8. Bont. *H. Nat.* 83. Hubart. *Nat. Ra.* 21 Jonſt. *H. Exang. Aq. Tab.* 7. *Muſ.* Reg. Soc. 120.

A King Crab of the Molucos Iſland. *Hubert's* Nat. Rarities, p. 21.

Cancer *Bont.* Hiſt. Nat. p. 83. *Fig.* Malâ & *Deſcript.*

Cancer Moluccanus *Cluſ.* Exot. 128. *Fig.* opt. *Dorſi* & *Ventris* cum *Deſcriptione* accuratâ. *Muſ. Worm.* 249. *Fig.* bonâ *Dorſi* & *Ventris* ac *Deſcript.*

Cancer Molucenſis *Jonſt.* Hiſt. de Exang. Aquat. *Tab.* 7. *Fig.* 1, & 2. ſine deſcript. *Muſ. Regal. Societ.* 120.

Signoc ſeu Siquenoc *Incolis* Novæ Franciæ, Aragneæ de Mer. *nob.* Laet. *Ind. Occid.* 60. Fig. D. & V. opt. & Deſc. *Gal.* id. *Lat.*

The whole *Structure* of this *Animal* is very remarkable, and particularly his *Eyes* are wonderfully contrived; *viz.* Between the fourth and laſt Pair of Claws on each Side, reckoning from his Mouth (and excluding the ſmall Pair there plac'd) are inſerted, as it were, the Rudiments of another Pair or a Claw broken off on each ſide at the ſecond Joynt or Elbow; On theſe Extremities, are the *Eyes* placed (like thoſe on the Horns of *Snails*) but being under the Covert of a very thick and Opake Shell, *Nature* in that Place has wonderfully contrived a Tranſparent *Lanthorn*, through which the Light is conveyed, whoſe Superficies very exactly reſembles the great Eyes of our large *Libellæ*, or *Adderbolts*, which to the naked Sight are plainly perceived to be compoſed of innumerable *Globuli*; theſe, like them, are oblong, and guarded with a *Teſtaceous Supercilium.*

SECT

SECT II.

We proceed next to the *Teſtaceous Animals.*

Viz.

SHELLS. Land-ſhells

COchlea *terreſtris major ſtriata, ore compreſſo.* 3.
Cochlea *Virginiana* Liſt. *Hiſt. Conchyl.* Lib. 1. Fig. 45.

Cochlea *terreſtris* Virginiana *media umbilicata, ſtriata, ore unidente compreſſo.* Cochlea *umbilicata, capillaceis ſtriis per obliquum donata, unico dente ad fundum oris,* Liſt. *H. C: L. Fig. 91.* Liſt. *Hiſt. Conch.* L. 1. Fig. 91. 4.

Cochlea *ter.* Virginiana *inſigniter ſtriata, umbilico magno.* 5.

Cochlea *umbilicata, fuſca, ſive variegata, capillaribus ſtriis leviter exaſperata* Liſt. *H.C.* L. 1. Fig. 69. Liſt. *H. C. L. 1. F. 69.*

Cochlea *ter.* Virginiana *minor, ſtriata & umbilicata, ore tridentino.* 6.

Cochlea *parva umbilicata, tenuiter ſtriata, tridens,* ſcil. *in triangulo poſiti, nempe* unus *ad fundum oris,* alter *ad columellam,* tertius *ad labrum* Liſt. *H. C. L.* 1. Fig. 92. Liſt. *H. C. L. 1. F. 92.*

SECT III.

Next to theſe we place

The Cruſtaceous Inſects:

Being ſuch whoſe Membranaceous Wings are wholly, or in part, covered with a hard or Cruſty Sheath.

SCarabæus Marianus *viridis Rhinocerotos.* 7.
An *Naſicornis* Virginianus *Muſ. Trad.* 15? *Muſ. Trad. 15?*

8. *Scarabæus* Marianus *viridis acerotos.*

These two, I believe, are *Male* and *Female.*

9. *Scarabæus* Marianus *minor fulvus, maculis nigricantibus aspersis.*

10. *Scarabeus verrucosus minor* Marianus *cænosi coloris.*

Mus. Trad. 16. *An* Scarabæus *instar Bufonis* Virginianus, *Mus. Trad.* 16.

11. Scarabæus *stramineus minor* Marianus, *maculis aterrimis diversimodé notatus.*

12. Scarabæus *oblongus niger* Virginianus, *vaginis sulcatis dorso plano nitente.*

This my kind Friend, Mr. *James Marshal*, gave me, who received it from *Virginia.*

13. Scarabæus *elasticus major* Americanus *capite bimaculato.*

Mof. 112. *fig. id. Angl.* 978. *fig.* *an* Cocujas *Mof.* 111. *Fig. id.* Angl. 977?

The first of these I received from my worthy Friend, Mr. *Charlton.*

This is commonly about an Inch and half *long*, of which the *Head* takes up a third part, which is near as broad as long; the *Sides* are grey or frosty; the *Middle* black: what in this part is most remarkable, are, *two* very *black oval Spots*, in Texture, Colour and Softness much resembling the blackest and finest *Velvet*, being encompass'd with a whitish Circle.

These orbicular Spots, to most People, at first view seem to be their *Eyes*, though they are ten times less, and plac'd at the setting on of the *Horns*, which are about half an Inch *long*, composed of *eight Serræ*, or *Teeth*, notcht on the under side only.

The *Vaginæ* or *Wing-sheaths* are long, black, sulcated and plentifully sprinkled with white Specks, the *under Part* and *Belly* is frosted on the *Sides* and in the *Middle* of a shining black.

The

The *Structure* of this *Insect* is the same with a peculiar Species I have seen in *England*, and call *Snap-Beetles*, from their elastick or springing Faculty, by which (without being fore-warn'd) they will easily force themselves out of your *Fingers:* I have also frequently observed, that if you lay them on their *Backs* (they not being able to turn on their *Bellies*) will spring or raise themselves to a wonderful Height, and that for several times, until they fall on their *Legs.*

Scarabæus *elasticus medius* Marianus *hirsutus.* 14.

Scarabæus *elastacoides* Marianus, *vaginis ex nigro aurantioque mixtus.* 15.

Cycindela Mariana, The Fire-Fly, *vaginis teneris fuscis marginibus fulvis.* 16.

Cantharis Anglica *viridis, maculis aureis insignitis.* 17.

Cantharis 4 *Moff.* 145. Fig. *id.* Angl. 1003. Fig. *Jonst. Insect.* Tab. 15. Fig. 4. *List.* Hist. Anim. Angl. app. Tab. 3. *Scarab.* Fig. 6.

Mof. 145. *id.* Angl. 1003. Jonf. *Inf. Tab.* 15. *Fig.* 4. List. *H. A. A. app. Tab.* 3. *Scar. Fig.* 6.

Cantharis Mariana *viridis. lituris marginalibus aureis insigniter notata.* 18.

The *Spots* in this are *larger* and *finer markt* than the last.

Cantharis Mariana *fusca, meandris marginalibus pallidis incurvatis.* 19.

Capricornulus nigrescens Marianus, *undis & circulis flavescentibus striatus.* 20.

SECT

SECT IV.

We come now to the *Plants*, and therein, following the *Method* of the Learned Mr. *Ray* in his *Hiſtory*, &c. and Dr. *Sloane* his *Catalogue* of *Jamaica Plants*, we ſhall begin with the *leſs perfect* ones:

Viz.

1. *Muſcus Filicinus* Marianus *repens pinnis brevioribus.* This differs from *our common Fern Moſs* in having ſhorter Wings ſet oppoſite from the middle Rib, which creeps along the Ground, and is not branched.

2. *Muſ. Petiv. 76.* A. *Branched Coralline Moſs.* Muſ. Pet. 76. This grows with us very plentifully on moſt *Heaths.*

3. *Ray H. Pl. 1928?* *Trichomanes major* Marianus *longifolius,* An *Trichomanes major foliis longis auriculatis* Raii H. H. Pl. 1928.

4. *Cornutus* his *Canada* Maiden-hair.

CB. 355. ---Prodr. 150. Cornut. 7. Park. 1050 Adianthum *Americanum* Cornuti 7. *fig.* Virginianum *Tradeſcanti* Park. 1050. Fruticoſum *Americanum* Ejuſd. 1050. Fig. frut. *Braſilianum* CB. 355. & *Prodr.* 150. *deſc.* frut. *Amer.* ſummis ramulis reflexis & in orbem expanſis *Pluk.* Tab. 124. fig. 2.

5. *Filix* Mariana *pinnulis ſeminiferis anguſtiſſimis.*

6. *Ophioglooſſum* Marianum *linguâ dentatâ.*

7. *Cat. Pl. Jam. 30. CB. Phyt. 20.* A. *Gramen Paniceum maximum, ſpicâ divisâ, ariſtis armatum.* Cat. Pl. Jam. 30. *Panicum Sylveſtre cum ariſtis* CB. *Phyt.* 20. N° 93. I have added this *Synonym* becauſe omitted by Dr *Sloane*, to whom I refer you for the reſt.

Small

Small *Engliſh* Hairy Graſs. 8.

A. *Gramen exile hirſutum* Ger. 16. fig. *id.* emac. 17. fig. *Juncus villoſus capitulis Pſyllii* Hiſt. des Plantes des environ de *Paris* 105. *Raii* H. Pl. 1291. *Syn.* 193 ed. 2. 263. Ger. 16. ---emac. 17 H.Pl.Paris 105.

Gramen Cyperoides minus ſpicâ parvâ. 9.

A. *Millet* Cyperus Graſs. 10.

Cyperus gramineus Miliaceus Ger. emac. 30. fig. *Raii* H. Pl. 1171. *Synops.* 200. *ed.* 2. 271. Ger.em.30. Ray H. Pl. 1171. Syn. 200. ed. 2. 271.

Cyperus gramineus paniculâ ſparsâ ſubflaveſcente. 11. Alm. Bot. *Gramen Cyperoides minus paniculâ ſparsâ ſubflaveſcente* CB. 6. & *Gr. Cyp. minimum panicula ſubflava* Ejuſd. *Phyt.* 14. *Gr. Cyp. pan. ſparsâ ſubflaveſcente* Park. 1268 *Gr. pulchrum parvum paniculâ latâ compreſsâ* IB. L. 18. p. 470. Fig. & *Chabr.* 184. *Raii H. Pl.* 1301. Alm. Bot. CB. 6. ---Phyt. 14. Park. 1268 IB. l. 18. p. 470. Ray H. Pl. 1301.

This is found in moſt watry Places in *Germany*, *Italy*, and *Provence*. Place.

Gramen tomentoſum Virginianum *paniculâ magis compactâ, aureo colore perfusâ* Pluk. Tab. 29. 9. Fig. 4. χρυσοπαπ& dici poſſit *Alm. Bot.* 179. 12. Plu.T.299. F. 4. Alm. Bot. 179.

The leaſt *Engliſh* Ruſh. 13.

Juncellus *Lobelii* Park. 1192. *Raii* H. Pl. 1304 *Syn.* 203 *ed.* 2. 274. Par. 1192 Ray H. Pl. 1304. --Syn. 204. --ed. 2. 274

It *Flouriſhes* with us in *June* and *July* in moiſt, ſandy and boggy Places.

Varietaria foliis ex adverſo naſcentibus Urticæ racemiferæ floré Cat. Pl. Jam. 50. 14. Cat. Pl. Jam. 50.

This Dr. *Sloane* obſerved to grow plentifully on the moiſt and ſhady Rocks in *Jamaica*.

After Americanus *albus latifolius, caule ad ſummum brachiato* Pluk. *Tab.* 79. *Fig.* 1. & *Alm. Bot.* 56. 15. Pluk. 79.

Dr. *Pluknet's Figure* very well reſembles this Plant, the *Leaves* are ſomewhat hairy, and on the back ſide very Fig. 1. Al.Bot. 56.

full

full of Veins; they are near three Inches and half *long*, and ſomewhat more than an Inch *broad*; are ſharp at each end and Stalkleſs: The *Flowers* are *white*, ſtanding on long Footſtalks, and branch towards the top.

This I have obſerved for ſome Years growing in our *Phyſick-Garden* at *Chelſey*.

16. *Aſter* Marianus, *foliis rigidis, floribus parvis umbelliferis.*

17. *Aſter* Americanus *albus*, Mezerei Arabum *exaſperatis foliis, florum petalis reflexis.* Pluk. *Tab.* 79. Fig. 2 *Alm. Bot.* 56.

Theſe *Flowers* are very *ſmall*, and ſtand many together, like an *Eupatorium*; the ſcaly Tips are green, the *Petala* long, white, narrow, and ſeldom more than five or ſix in a *Flower*.

18. *Chryſanthemum* Americanum *laciniato folio majus* H. Bleſ. 251.

Hort. Bleſ. & Oxon. *Hort.* Pat. & Gron. *Hor.* L.Bat. & Tradeſ. Park. 32. CB. *ap.* 516. Ray *H. Pl.* 339.

Doronicum Americanum *Hort. Oxon.* H. Patav. & *L. Bat.* H. Gron. & *Tradeſc.* Park. 321. & 2. *Fig.* Amer. *laciniato folio* CB. *app.* 516. *Deſcr.* Amer. *fol. diſſecto* H. Hafn. *Ray* H. Pl. 339.

19. *Pluk.* 116. *fig.* 6. *Alm. Bot.*

Virga aurea Americana *Tarragonis* facie & ſapore, paniculâ ſpeciociſſimâ *Pluk.* Tab. 116. fig. 6. & Alm. Bot.

20. *Pluk.* 58. *fig.* 3. *Alm. Bot.* 141.

Eupatorium Marianum *foliis Meliſſæ rigidioribus.* An *Eupatoria Valerianoides flore niveo, Teucrii foliis cum pediculis* Americana *Pluk.* Tab. 58. Fig. 3. & *Alm. Bot.* 141.

21. *Pluk.* 87. *fig.* 3. *Alm. Bot.* 140.

Eupatorium Marianum *Meliſſæ foliis tenuioribus, floribus purpuraſcentibus filamentoſis.* An *Eupatorium* Americanum *Meliſſæ foliis magis acuminatis* Pluk. *Tab.* 87. Fig. 3. & *Alm. Bot.* 140.

Baccharis

Baccharis Marianus *flore pulchrè rubente.* 22.

Flos ſolis Marianus *foliis pyramidalibus ſcabris ex adverſo ſeſſilibus.* 23.

Flos ſolis Marianus *foliis latioribus flore mixto.* 24.

Flos ſolis Marianus *foliis anguſtioribus fl. mixto.* 25.

Chryſanthemum *piloſiſſimum umbone purpuraſcente, petalis extus villoſis.* 26.

Chryſanthemum Marianum *foliis abrotani maris.* 27.

Nardus Americana *procerior foliis cæſiis* Pluk. *Tab.* 101. Fig. 2. *Alm. Bot.* 28. *Pluk.* 101. *Fig.* 2. *Alm. Bot.*

I have obſerved this ſtately Plant for ſeveral Years in our *Phyſick Garden* at *Chelſey*, growing more than two Yards high, with Leaves ſomewhat like our *Gooſefoot*, but much larger, and underneath of an Aſh Colour.

Carolina Globe-Tree. 29.

Valerianoides Americana *flore globoſo, Piſhaminis folio* Muſ. Petiv. 293. *Muſ. Pet.*

Arbor Americana *tryphyla, fructu Platani quodammodo æmulante*; Lignum Fibularium (i. e.) Button-wood *noſtratibus dicta* Pluk. *Tab.* 77. Fig. 3. *Alm. Bot.* 47. *Pluk.* 77. *Fig.* 3. *Alm. Bot.* 47. 336.

Scabioſa *dendroides* Americana, *ternis foliis circa caulem ambientibus, floribus ochroleucis* Alm. Bot. 336.

This formerly grew at the *Phyſick Garden* at *Chelſey*, and this Year I ſaw it in Mr. *William Darby*'s Garden at *Hodgsdon.*

I have put this *Plant* (until I find a more proper Place) next to the *Valerians*, becauſe its *Flowers* are very like them. N. B.

Laſerpitium Americanum *Fraxini folio* Muſei Petiv. 255. 30. *Muſ. Pet.* 255.

Hippoſelinum Marianum *foliis integris & trifidis.* 31.

The lower *Leaves* are more or leſs round or pointed, and ſerrated like our *Catha palauſtris*, but much ſmaller, not exceeding thoſe of the *Garden Violet*, which they much reſemble, theſe ſtand on longer or ſhorter *Footſtalks*,

ſheathed at the Baſe, thoſe above are wholly vaginated (or ſheathed) and come trifoliate at every Joynt; its *Flowers* are ſmall and yellowiſh.

32. A. Our leaſt *Water-Parſnep* with various Leaves. *Sium minimum* Raii *Cat. Angl.* & H. Pl. 444. *Syn.* 67. ed. 2. 107. *min. Ferulaceis foliis* Hort. Bleſ. 193, & 309. *min. umbellatum foliis variis* Pluk. *Tab.* 61. Fig. 3. *puſillum fol. variis* ND. *Phyt. Brit.* aq. *pumilum foliis inferne Fæniculaceis ſuperne lobatis* Moris *Tab. inedit.*

Ray Cat. Angl. --H.Pl.144 --Syn. 67. --ed.2. 107. Hort. Bleſ. 193 & 309. Pluk. 61. Fig. 3. Phyt. Brit. 114.

33. *Symphylum* Marianum *foliis Echii latioribus.* Theſe *Leaves* are near an Inch broad, and between Two and Three long, are ſet alternately cloſe to the Stalk, and taper at each end; in Texture very much reſembling our *Vipers Bugloſs*, but broader.

34. *Teucrium* Marianum *ſpicatum Menthæ folio.*

35. *Mr.* Ray's *Virginia* Snake-weed.

Ray H. Pl. 534. H.A.L.Bat. 161. Breyn.Pr.2. Pluk. 54. Tab. 2. Alm. Bot. 110.

Pulegium Virginianum *nonnullis*, aliis *Serpentaria* aut *Colubrina* Virginiana *Raii* H. Pl. 534.

P.Virg *anguſtifolium* (Serpentaria *dictum*) floſculis in cymis. *an potius* Clinopodium *Pulegii anguſto rigidoque folio* Virg. *floſculis in cymis.* Pluk. *Tab.* 54. *Fig.* 2. & *Alm. Bot.* 110.

Pulegio Cervino quodammodo accedens capitata, Chamepityos Auſtriacæ cæruleæ *foliis* & *facie* Breyn. *Prodr.* 2.

Satureia Virginiana *Herm.* P. Bat. 218. Fig. & deſc. *floribus in ſummitate diſpoſitis* H. A. L. Bat.

36. *Dr. Herman's* Virginiana *Wild Baſil* with yellow Flowers.

H.A.L.Bat. 107. Ray H. Pl. 1927. Pluk. 24. Fig. 1. Alm. Bot. 111.

Clinopodium Virginianum *anguſtifolium flore luteo* D. de Marees *H. A. L. Bat.* 107. Virg. *anguſtif. floribus amplis luteis purpureo maculatis, cujus caulis ſub quovis verticillo* 10 *vel* 12 *foliolis rubentibus eſt circumcinctus* D. Baniſter

Alm.

Alm. Bot. 111. Virg. *anguſt. flor. amplis luteis, punctis purpureis* Pluk. *Tab.* 24. Fig. 1.

Origanum *floribus amplis luteis purpureo maculatis, cujus caulis ſub quovis verticillo* 10. *vel* 12. *foliis eſt circumcinctus* D. Baniſter *Raii H.Pl.* 1927.

Horminum Marianum *foliis pilis albis aſperſis.* 37.

Scutellaria Virginiana *Hyſſopi anguſtis foliis, flore cæruleo* Alm. Bot. 338. 38. *Alm. Bot.* 338.

Mr. *Baniſter*'s Columbine leav'd Crow-foot.

Ranunculus Thalictri folio radice grumoſa. D. Baniſter, *Raii H. Pl.* 1927. *nemoroſus Aquilegiæ foliis* Virginianus *Aſphodeli radice.* Pluk, *Tab.* 106. *Fig.* 4. & *Alm. Bot.* 310. 39. *Ray H. Pl.* 1927. *Pluk.* 106. *Fig.* 4. *Alm. Bot.* 310.

Muntings yellow Paſſion Flower.

Paſſiflora Hepaticæ nobilis folio parvo non crenato, flore ex luteo viridante Alm. Bot. 282. 40. *H.R. Par. Hort. Piſan. Hor. Patav. Munt. Pra.* 422. *Moriſ. H. Ox.* 6. *Raii H. Pl.* 651. *H.A.L.Bat.* 205. *El. Bot.* 206. *Alm. Bot.* 282.

Clematis Paſſionalis *tryphyllos fl. luteo* Moriſ. *H.Ox.* 6. *Sect.* 1. *Tab.* 2 *Fig.* 3. *Cl.* Paſſiflora *fl. luteo* Munt. *Prax.* 422. *Fig. opt.* ſeu Flos paſſionis *fl. luteo* H. Piſari *Belluc:* ſeu *Fl. Paſs.* luteo flore *H. R. Par.* Raii H. Pl. 651.

Granadilla *pumila fl. parvo. luteo* D. Alex. Balam. *Cat. H. Pat.* a Turre 55. *folio tridentato, parvo flore flaveſcente* El. Bot. 206.

Cucumis Flos Paſſionis *dictus, Hederaceo folio, fl. ex luteo viridanti H.* A. L. Bat.

Cornutus his *Canada* Herb Chriſtopher. 41. *Cornut.* 76. *Park.* 379. *Moriſ. H. Ox.* 8. *Ray H. Pl.* 662.

Chryſtophoriana Americana *racemoſa baccis niveis & rubris* Moriſ. *H Ox.* 8. *Sect* 1. *Tab.* 2. *Fig. opt.* 7. Amer. *baccis niveis & rubris* Park 379. *Fig.*

Aconitum *baccis niveis & rubris Corn.* 76. *Raii H.Pl.* 662.

Mr. *Fiſher*, a Friend of mine, brought me this *Root* from *Potuxen River* in *Maryland*, and he tells me, they there call it, *Rich-Root*, and uſe it as a *ſpecifick* againſt the *Scurvy*; they boyl about a Pound of it in two Gal-

lons of *Cyder*, till but two Quarts remain, and being ſtrained, they drink half a Pint of it every Morning, either alone, or mixt with any other Drink.

He aſſured me it cured him, and ſeveral others in the ſame Ship he came from thence in.

42. Spike-flowred Meadow-ſweet.

CB. 163. *Barba Capri* Ger. *emac.* 1043. *IB.* V. 3. L. . 488. Fig. *Chabr.* 488. *floribus oblongis* CB. 163. *Phyt.* 276. Ger. em. 1043. *Ulmaria major ſive altera* Park. 591. Fig. *Raii H. Pl.* 709. Park. 591. Ray H. Pl. 709.

43. Gentiana *major* Virginiana, *floribus amplis ochroleucis* Pluk. *Tab.* 186. Fig. 1. & *Alm. Bot.* 166. Pluk. 186. Fig. 1. Alm. Bot. 166.

Theſe *Leaves* are very like thoſe of *Sope-wort*, and ſtand croſs-wiſe, or alternately oppoſite, convoluting the Stalk, which is round.

Its *Flowers* one Inch and three quarters long and pale, growing towards the top of the Stalk; its *Calyx* half an Inch deep, and then divides into five narrow greeniſh Beards three quarters of an Inch long, reaching almoſt to the Dents or lower Angles of the *Flower*.

44. *Gentiana major* Virginiana, *flore cæruleo longiore* Moriſ. *Tab. inedit.* Fig. Moriſ. Tab. inedit.

Theſe *Leaves* ſtand alſo oppoſite like the laſt but are much narrower and glaucous underneath.

The *Flowers* blew, and broader at the Top than the laſt, and the Segments or Angles, not ſo ſharp nor deeply indented, the *Calyx* like the other, but the foliaceous Beards ſhorter.

45. *Erinus* Marianus *ferè umbellatus, Majoranæ folio.*

46. Perfoliate Venus Looking-glaſs.

Hort. Reg. Paris. Moriſ. H. Ox. 457. Ray H. Pl. 743. Speculum Veneris *perfoliatum* ſeu *Viola pentagonia* perfoliata *Raii H. Pl.* 743. Campanula pentagonia *perfoliata* Moriſ. H. Ox. 457. *Sect* 5. *Tab.* 2. *Fig.* 23.

Onobry-

Onobrychis *peregrina perfoliata folio rotundiori.* Hort. R. Paris.

American Scarlet Cardinal-Flower. 47.

Flos Cardinalis *Barberini* Col. in *Hernand.* 880. Fig. *Card.* ſeu *Trachelium* Americanum *H. L. Bat.* & H. *Groning.* Cardinalitius ſ. *Trachel.* Indicum *H. Pat.* *Park. Para.* 355. *Col. in Her.* 880. *Ferrar.* *Hort. R.* *Hafn.* *Hort. Gron.* *Hort. Lugd. Bat.* *Moriſ. H.* *Ox.* 466. *Ray H. Pl.* 746.

Trachelium Americanum *rubrum* Ferrar. *Raii H. Pl.* 746. Amer. ſ. *Cardinalis planta* Park. parad. 355. *Fig.* Amer. *fl. ruberrimo ſ. Planta Cardinalis* Ejuſd. 356. *deſcr.* & la Broſſ. *H. R. Par.* Indicum *Cardinalitium* dictum *H. R. Hafn.*

Rapuntium *galeatum* Virginianum ſ. *Americanum* coccineo flore majore *Moriſ.* H. Ox. 466. *Sect.* 5. *Tab.* 5. *Fig.* 54.

Moriſons *Virginiana* Blew Cardinal-Flower. 48.

Rapunculus galeatus Virginianus, *flore violaceo majore* Moriſ. *H. Ox.* 466. *Sect* 5. *Tab.* Fig. 55. Robert *Icon.* Dodart. *Mem.* 119. Moriſ. *H. Ox.* 466. H. A. L. *Bat.* 107. Ray *H. Pl.* 1883.

Trachelium Americanum *flore cæruleo* Icon. Roberti. *minus* Amer. *foliis rigidioribus fl. cæruleo patulo* Hort. Reg. *Paris.* Amer. *minus fl. cærul. patulo* Dodart. *Mem.* 119. Raii. *H. Pl.* 1883. deſcr.

Campanula minor Americana, *foliis rigidis fl. cæruleo patulo* H. A. L. Bat.

Digitalis *Mariana* Perſicæ folio. 49.

This I take to be the *Humming Bird Tree*, figured *in* Joſſelin's *New-England Rarities.*

Theſe *Leaves* ſtand oppoſite on half Inch Footſtalks, above four Inches long and three quarters broad.

Digitalis *Mariana* Filipendulæ folio. 50.

The *Flowers* of this elegant Plant ſtand on naked Footſtalks near an Inch long, they generally grow by pairs one againſt the other, each divided into five equal round Segments like thoſe of *Yellow Tobacco*, but three times bigger; theſe are ſet in a *Calyx* whoſe Diviſions are fimbriated like a Lobe or Wing of its Leaves. Its *Style* is thready, and about an Inch long. *Alectro-*

51. *Alectorolophus* [illegible] *Blattariæ folio.*

Their *Leaves* are [illegible] to eight or ten ſerrated Lobes, which for the moſt part ſtand oppoſite, each Leaf is about the Length of the *Footſtalk* it ſtands on, *viz.* if full grown, five Inches, or thereabouts.

Its *Seed-Veſſels* are oblong pointed *Husks*, which open on the upper Edge; they grow in a Spike on each ſide the Stalk, and are guarded, eſpecially the upper Side, with a hoary membranaceous *Calyx*.

52. *Crateogonon* Marianum *flore cæruleo.*

53. *Turritis* Mariana *ſiliquis dependentibus, uno verſu diſpoſitis.*

The *Pods* are about two Inches long, flat, ſomewhat crooked, and end as it were in a blunt ſpine, they ſtand on half Inch Footſtalks, and are thin ſet on all ſides the Stalks, but have a Tendency only one Way.

54. Cornutus *his* Canada *Celandine.*

Cornut. 212. Park. 617. -- 327. Moriſ. *H. Ox.* 257. Ray *H. Pl.* 1887. *Chelidonium maximum* Canadenſe *αχαωλον Corn.* 212. fig. *Park.* 617. *Moriſ.* H. Ox. 257. *Sect* 3. *Tab.* 3. *Fig.* 1. Raii *H. Pl.* 1887.

Ranunculus Virginienſis *albus* Park. 327. *Fig.* an *Virginianus* Muſ. *Trad.* 160?

Alm. Bot. 280. *Papaver corniculatum ſeu Chelidonium humile cauliculo nudo, flore albo ſtellato* Alm. Bot. 280.

55. *Chamæſyce* Mariana *ramoſiſſima dichotomos, foliis Polygoni minoribus.*

56. *Chamæſyce* Mariana *Lyſimachiæ campeſtris* Gerardi *folio.*

N. B. The remaining *Herbs* and *Trees*, with ſome *Foſſils* and *Animals*, not here mentioned, ſhall be the Subject of another Paper.

III. *Captain*

III. *Captain* Langford's *Obſervations of his own Experience upon Huricanes, and their Prognoſticks. Communicated by Mr.* Bonavert.

IT hath been the Cuſtom of our *Engliſh* and *French* Inhabitants of the *Caribee Iſlands*, to ſend, in about the Month of *June*, to the Native *Caribees* of *Dominico* and St. *Vincent*, to know whether there would be any Huricanes that Year; and about Ten or Twelve Days before the Huricane came, they did conſtantly ſend them Word; and it very rarely or ſeldom failed, that ever I had Experience of, but the Inhabitants have pretended that ſometimes they did fail in their Prognoſticks, or rather in their Witchcrafts or Councel with the Devil, as they call'd it. But I hope I ſhall, in the enſuing Diſcourſe, both clear the Natives of that Aſperſion in this Matter; and likewiſe ſhew ſome certain Reaſons, back'd with Experience, that ſeldom, or never as yet, thoſe Prognoſticks have failed, as I have obſerved in Five Huricanes; One in the Year 1657. the others in *Anno* 1658, and 1660. and 1665, and 1667. Two of which I was at Sea in, without any Prejudice to my Ship, Maſts, Sails, or Rigging; I always fitting my Ship for ſuch a Storm, which I could give good Reaſons for, but I ſhall be too tedious; ſo I ſhall only divide what I have to ſay, into theſe Four Parts:

1. How I came to the Knowledge of theſe Signs or Prognoſtications.

2. What they are.

3. The

3. The Experience I have had by foretelling of Hurricanes, and the Benefit my ſelf and others have received thereby.

4. And *Laſtly*, Additional Reaſons of the Cauſe of the Hurricanes and their Bounds.

Firſt, How I came to the Knowledge of the Signs or Prognoſticks of the Hurricanes.

In the Year 1657. I. With Three Merchant-men bound for *Nevis* and *Jamaica*, came under the Iſland *Dominico*, where I had need to take in Proviſion for Cattel; but knowing the great hatred the Natives had againſt our Nation, (except his Highneſs Prince *Rupert*) notwithſtanding all the Means the Governors of thoſe Iſlands had uſed to the contrary, I was forc'd to put up *Holland* Colours, and by that Means drew Three of the *Indians* aboard me, and by the civil Entertainment I gave them, overcame ſo much their Jealouſies of our being *Engliſh*, that returning a Shore, they brought with them a conſiderable Number of Men, Women, and Children; furniſhing me with the things I wanted: And many of the Men ſtaying with me all Night, where the Entertainment we gave them, undeceived them ſo much of the ill Opinion they had of our Nation, that when in the End they diſcovered us to be *Engliſh*, in Return to our Civilities, they promiſed to ſend ſome of their chiefeſt Families after me to *Nevis*, to conclude a firm Peace with us. And to that purpoſe they left me Three Hoſtages. And when the reſt, that followed me, were, by one *Courtman*, a Maſter of a Ship, intercepted in order to make them Slaves, I prevailed with the Governor of St. *Chriſtophers*, who, conſidering the end they came

came for, ſet them free; and ſo the Peace with them was concluded, and ſome Years after ratified by my Lord *Willoughby*.

The Civilities I uſed towards them, on theſe and other Occaſions, made one of the Three Hoſtages reſolve to remain with me, which he did for Four Years, and to come over into *England* with me, where ſhortly after he died.

And from this *Indian* I had their Way of fore-telling the Hurricanes Fourteen Days before they come.

Signs or Prognoſticks of Hurricanes.

1. ALL Hurricanes come, either on the Day of the Full, Change, or Quarters of the Moon.

2. If he will come on the Full Moon, you being in the Change, then obſerve theſe Signs:

That Day you will ſee the Skies very turbulent, the Sun more red than at other times, a great Calm, and the Hills clear of Clouds or Foggs, over them, which in the high Lands are ſeldom ſo. Likewiſe in Hollows, or Concaves of the Earth, or Wells, there will be a great Noiſe as if you were in a great Storm, and at Night the Stars looking very big with Burrs about them, and the North Weſt Sky very black and foul, the Sea ſmelling ſtronger than at other times, as uſually it doth in great Storms; and ſometime that Day, for an Hour or Two, the Wind blows very hard Weſterly, out of his uſual Courſe.

On the Full of the Moon you have the ſame Signs, but a great burr about the Moon, and many times about the Sun.

The like Signs muſt be taken notice of on the Quarter Days of the Moon ; in the Months of *July*, *Auguſt*, and *September* ; for the Hurricanes come in thoſe Months; the ſooneſt that ever I heard of was the 25th of *July*, and the lateſt was the 8th of *September* ; but the uſual Month they come in is *Auguſt*.

3. *Thirdly*, the Benefit and Experience I have had of foretelling theſe Hurricanes is, that whereas hererefore they were ſo dreadful, that all Ships were afraid to go to Sea, and did rather chooſe to ſtay in the Roads at Anchor, than to run the hazard of the mercileſs Sea, although never Ship eſcaped at Anchor, but was caſt a-ſhore ; many times, by the Violence of the Storm, ſome Veſſels have been caſt ſo far on the Shore, that when the Storm was over, they have been from Twenty to Thirty Yards dry from the Waſh of the Shore, and the Veſſels ſet whole ; and by this Means the Lives of thoſe that were in thoſe Veſſels were ſaved. But I, finding that if a Man keeps his Ship ſailable, with good ſtore of Ballaſt, his Ports well Barr'd and Calked, his Top-Maſts down, and his Tops too, if he have time, his Yards a-Port lac'd, or long Ships, keeping ſecure his Doors and Windows of his Shipp, and ſhe will lye as well as in other Storms ; and they may, having their Ships in a readineſs, ſtay in the Road till the Storm begins, which is always firſt at North, ſo to the North-Weſt, till he comes round to the South-Eaſt, and then his Fury is over. So with the North Wind they may run away to the South, to get themſelves Sea-room, for driſt of the South-weſt Wind, where he blows very fiercely ; by theſe Means, I have, by God's Bleſſing, preſerved my ſelf in Two Hurricanes at Sea, and in Three at Shore, and I have had great Advantages by it.

For

For in thoſe at Sea I loſt not a Sail, Yard, or Maſt; they being two great Hurricanes. And in the Year 1667. I being a-ſhore at *Nevis*, there was a Hurricane on the 19th Day of *Auguſt*; and Fourteen Days before, I did take notice of the foregoing Signs, on a Full Moon; and I acquainted Sir *John Berry*, who was Commander of his Majeſty's Ship, *Coronation*, and ſeveral other Commanders there; who did make their Ships ready for the Sea; and in the Morning about Four of the Clock, the Wind coming hard Northerly, they put to Sea; and by God's Bleſſing, came all back, in Four or Five Days time, ſafe to the Road again, to the great Admiration of the *French*, then our Enemies; inſomuch that I was told, that a Capucin Fryar, in his Sermon to the *French*, after the Hurricane, ſhould uſe this Expreſſion: 'You 'may now ſee your Wickedneſs, in Praying for a Hur-'ricane to deſtroy the *Engliſh* Fleet, when you ſee they 'are all come back ſafe; and we have not a Houſe left 'to ſerve God in, nor for our own Convenience, nor 'Forts nor Amunition left to defend our ſelves againſt 'theſe preſerv'd Enemies. And the Governor of *Nevis*, and Planters, were for perſwading the Commanders of the Ships to ſtay, and not regard my falſe Propheſies, as they call'd it, they being very much offended with me for giving Sir *John Berry* this Councel; inſomuch that when Sir *John Berry* returned back from the Hurricane, I was the firſt that went aboard him, where he ſaluted me with many Thanks, and likewiſe uſed this Expreſſion; Is the old Governor's Houſe down as well as the reſt? I told him, It was down to the Ground. I am not ſorry, ſaid he, for him, for he would not believe it had been a Hurricane elſe; though he was ſorry to ſee the great Deſtruction it had made on the Shore.

The Second Benefit I found by Experience, on the Shore, was in this Year, 1667. That in the Storehouſe where I kept the Regiment's Amunition and Cloathes, I had a good Quantity of my Lord *Willoughby*'s Sugars, and my own; and I did, on the Confidence I had of the Hurricane's coming, with my Negroes, roll all my Sugars on Maſts of Ships, with high Clogs under my Maſts, and made Gutters for the Water to run away underneath, I being aſſured of the great Quantities of Rain that falls in this Storm; and on my Planchant over the Sugars I did lay all the Bundles of Soldiers Cloathes, and the Barrels of Powder on that; and then I laid all the Match on the Powder, and four or five Sails over the Match; the Clews of the Sails I ſpik'd all down to the Timbers: ſo that when the Hurricane had carried away the Roof of the Houſe; yet my Sugars and Goods remained all ſafe, that I loſt but one Hogſhead of Sugar, and that ſtood a-head open, by the Neglect of my Servants, where ſome ſmall Water got into it. And this I have put down that others that live in thoſe Parts may prevent thoſe great Damages they run, by taking ſome Care beforehand; if they did obſerve thoſe Prognoſticks, and follow my Example.

Laſtly, Reaſons and Cauſes of theſe Hurricanes, according to Experimental Obſervations of my Time.

This is ſo difficult a Matter, that I do expect great Objections thereto; but I ſhall raiſe ſome my ſelf, and anſwer them, leaving the reſt to better Judgments.

It is not unknown to all Men of Experience, that to the Southward of the Tropicks there is conſtantly a Trade-Wind, or Eaſterly Wind, which goes from the North to the South-Eaſt all the Year about; except where there are Reverſions of Breezes, and In-Letts near

near the Land; ſo that when this Hurricane, or rather Whirl-Wind, comes in Oppoſition to the conſtant Trade-Wind, then he pours down with that Force and Violence, that it exceeds all Storms of Wind in the World, and, as I have ſaid before, nothing can withſtand him; for he takes Trees away by the Roots, and thoſe that are extraordinarily ſtrong rooted, he twiſts off in the Middle: That in the Hurricane in 1667. at *Nevis*, I ſaw the high Mountain that was all green with Trees, left in moſt places bare, and the Wood lying in ſuch a Condition, with half Trees, or Stumps, or quarters, that one would think it almoſt incredible. Many other Stories of Truth I could relate, as to this ruinous Storm; but it will be too tedious: So I ſhall leave it to others Relation, and go on with the matter in hand, to ſhew the Cauſe of theſe violent Storms, according to my beſt Judgment and Experience.

Firſt, It is remarkable by all Men that have been in thoſe Parts, where the Sun comes to a *Zenith*, that at his approach towards the *Zenith*, there is always fair Weather; But at his return to the Southwards, it occaſions off the North Parts of the *Equinoctial*, generally much Rains and Storms, as Tornadoes, and the like; which makes the Wind in the Tornadoes to come on ſeveral Points. But before it comes it calms the conſtant Eaſterly Winds; and when they are paſt, the Eaſterly Wind gathers Force again, and then the Weather clears up fair: and this I mention to come the more clearly to my Diſcourſe of the Cauſe of Hurricanes.

Secondly, The Wind being generally betwixt the *Tropicks* and the *Equator* Eaſterly, unleſs at ſuch times as before declared; meeting with the Oppoſition of theſe Hurricanes, which comes in a contrary Courſe to that Trade-Wind, as is generally called by Navigators doth cauſe this violent Whirl-Wind, on the Sun's leaving the

Zenith

Zenith of *Barbadoes*, and thoſe adjacent Iſlands; by which the Eaſterly Wind doth much decay of his Strength: and then the Weſt Wind, which is kept back by the Power of the Sun, doth with the greater Violence and Force pour down on thoſe parts where he encroaches. And it is uſual in our ſailing from *Barbadoes*, or thoſe Iſlands to the North, for a Weſterly Wind, when we begin to loſe our Eaſterly Wind, to have it calm, as it is before Hurricanes: And then the Wind ſpringing up, cauſeth it, till it comes well ſetled, to be various, but after the ſetled Weſterly Wind comes freſh, we have been conſtantly without thoſe Shufflings from Point to Point. Here is to be obſerved, that all Hurricanes begin from the North to the Weſtward, and on thoſe Points that the Eaſterly Wind doth moſt violently blow, doth the Hurricane blow moſt fiercely againſt it; for from the NNE. to the ESE, the Eaſterly Wind bloweth freſheſt; ſo doth the W.NW. to the SSW. in the Hurricane blow moſt violent; and when he comes back to the SE. which is the common Courſe of the Trade Wind, then he ceaſeth of his Violence, and ſo breaks up.

So, with Submiſſion to better Judgments, I take the Cauſe of Hurricanes to be the Sun's leaving the *Zenith* of thoſe Parts towards the South. And *Secondly*, the Reverſe or Rebounding back of the Wind, which is occaſioned by the calming of the Trade-Wind.

But it will be objected, Why ſhould not this Storm be all over thoſe Parts of the *Weſt-Indies*, as well as *Barbadoes* and the Leeward-Iſlands?

To which I anſwer, That it hath in about Twenty-five Years of my Experience, taken its Courſe from *Bermudoes*, or *Summer Iſlands*, to the *Caribee-Iſlands*; but ſeldom or never doth he carry ſuch a Breadth as from the Latitude of Sixteen to Thirty-two Degrees, which is the Latitudes of the one and other Places; but it hath been

been obſerved, that when Hurricanes have been in *Martinico*, which is within Two Degrees of Latitude, and Two Degrees of Longitude, according to the Miles of that Circle, yet no Hurricane hath been in *Barbadoes*; Nor could I ever call any of the former Storms at *Barbadoes* Hurricanes, till that laſt Year in 1675. Again it hath been noted, that Hurricanes have done the like to the Northwards:

For when the Hurricane hath been in *Antegoa* and St. *Chriſtophers*, thoſe Ships that were but in the Latitude of Twenty Degrees had no Hurricane, but conſtant Weſterly Winds, reaſonable fair, and then there were no Hurricanes in *Bermudos*; and when the Hurricanes were at *Bermudoes*, the Leeward or *Caribee Iſlands* had no Hurricane; nor had thoſe Iſlands the Hurricane when *Barbadoes* had it.

Now it will be objected, Why the Hurricane was never known to go farther to the Weſtward than *Porto Rico*, which lies in or near the Latitude of thoſe Iſlands of St. *Chriſtopher*'s?

To this I anſwer, That from *Porto Rico*, Downwards, both that Iſland as well as *Hiſpaniola*, and other Iſlands there adjacent, are of vaſt Greatneſs and very high Lands, that of themſelves doth moſt commonly give Reverſal or Weſterly Winds at Night, through the Year; For there, for the Reaſons aforeſaid, the Eaſterly Wind, towards Night doth calm, and thoſe Lands afford a Land-Wind, which the other Iſlands cannot do, by reaſon of the Smallneſs of thoſe *Caribee-Iſlands*; but very near the Shoar, the Trade-Wind having his full Power till this general Whirl-Wind comes, for the Reaſons aforeſaid.

I do imagine ſo likewiſe to the Southwards of *Barbadoes*, where the Tornadoes come frequently, there is no Hurricanes; neither was there at *Barbadoes*, when theſe Tornadoes did commonly come there, which made ſome ſmall

ſmall Reverſal, though it was but for Two or Three Hours: Yet the Eaſterly Wind, giving ſome Way by the Sun's declining from that *Zenith*, doth prevent this furious Reverſe, where it hath no Vent till by the Violence of the Two Winds it is forc'd.

I could ſay ſomething more as to the Storms to the South part of *America*, when the Sun declines from them to the North; but ſhall leave it to others of more Experience in thoſe parts, I having been but once there.

And I could ſay ſomething of the Cauſe of the uncertain Rules for the Currents in the *Weſt-Indies*, but for fear of being too tedious, will make an end.

IV. *Concerning*

IV. *Concerning the Magnetiſm of Drills; by Mr.* Ballard. *Communicated by Dr.* William Muſgrave, *Fellow of the Colledge of Phyſicians and R. S.*

1. AS to the firſt Propoſition, *viz.* that a Drill in boring of Iron will acquire a vigorous Polarity. I ſuppoſe it does not fully appear from hence, That all the common Drills in a Smith's Shop, which probably have been uſed moſtly, if not only, in Iron, and never been within the Virtue or under the Touch of any Loadſtone, do, with their Bitts, conſtantly draw the South End of the Needle; and conſequently are themſelves a fixt N. Pole: For I cauſed Six or Seven ſeveral Drills to be made before my Face, and the Bitt or Point of every one became a N. Pole, only by hardening, before they ever came to be workt, either in Iron or any other matter; ſo that I cannot ſuppoſe thoſe found in a Shop to have gotten their Polarity ſo much from their after uſe, as from their firſt make.

2. That pieces of plain Iron, in Shape like Drills, (that is ſomething long and ſmall) do always change their Poles as they are inverted, the end downwards being ever the N. Pole; I find not always true: For though it hold generally in ſuch ſmall pieces, and always (as far as I can yet find) in pieces of any Bulk, as large Hammers, Anvils, Andirons, Bars of Windows, *&c.* yet I found ſeveral ſmall pieces of Steel, ſuch as the Drills are made of, to have fixed Poles, one end North, the other South, in whatever Poſtures I held them. Some of theſe very vigorous in ſuch their Polarity; others ſhewing plainly a Tendency to ſuch a Pole, rather than

the other; yet ſo faintly, that it applied contrary to their Inclination; (that is, at the upper end, if it affected to draw the South; or the lower end, if the North.) They cauſed the Needle to ſtand in *æquilibrio*, Eaſt and Weſt; the particular Inclination of either one end ſeeming in ſome pieces, quite to conquer; in others, quite to hinder that more general Polarity they both acquire, by being either upward or downward. Yet this ſeems only to be found in ſmall Stems of Iron; the being either upward or downward always prevailing in pieces of greater Bulk.

3. As to the Opinion of the Magnetick Philoſophers, that nothing gives or receives a Magnetiſm, but what is in it ſelf truly Magnetick, as is only Iron; as to the laſt part, that is, only Iron receiving a Magnetiſm, I have nothing certain to ſay, but for giving the ſame; I ſuppoſe it very queſtionable, whether only Iron (or what is of near kin to it, as we ſuppoſe the Loadſtone it ſelf to be) can beſtow or impart ſuch Virtue, ſince not only, as I have ſaid before, the quenching in Water will do it, but the heating alſo of an Iron by violent Motion, will do the ſame; as by quick and hard filing, which is the very ſame thing as brisk drilling in the Iron; and therefore may be ſaid to proceed from the File which is Steel or Iron. But to ſhew it comes from the meer Motion (or heat, which is nothing elſe but the Motion continued). This Experiment may ſuffice, if it ſucceed to others as it ſeem'd to do to me. I took my Knife, which had been formerly toucht (a quarter of a Year or more before,) and profering it to the Needle, it drew the North Pole; which happened right for my purpoſe. I whetted it briskly on a dry dirty Threſhold, and being thin, it became very hot towards the Point, the Edge being whet away to a Wire, as they term it, I ſtruck the very top, and back towards the top, againſt the Ground, as I had done

done the ſides, to deſtroy and rub off, if I cou'd, all its former Polarity which was Southward; then offering it again to the Needle, it drew the South end, and was quite changed. To confirm the thing, I toucht the ſame Knife again with the North Pole of my Loadſtone, and it drew vigorouſly the North End of the Needle. I whet it again ſtrongly in the ſame manner, and it changed again. This I repeated five or ſix times, and it ſtill changed by whetting, eſpecially on the ſides towards the top of the Knife, the very top and back, which cou'd not be whet to ſo great an Heat, retaining ſtill ſome affection for that Pole the Loadſtone had enclin'd them to. This I try'd with a Knife of a thicker Blade; but I could not with my Hand whet it to that Heat as to have the ſame Effect wrought upon, as on my own; though I uſed ſuch force as at laſt to break it in two. I borrowed then another thinner; but preſently had the ſame Misfortune. I intend therefore to try it at a Cutler's Wheel, laid with Emery and Oyl; and likewiſe on a Grindſtone, both wet and dry; and I rather chooſe the Grindſtone, becauſe the other Wheel may be ſuppoſed to have much Iron worn into it from the many Knives that have been ground on it, and ſo the Effect if produced will prove no more than that of filing with, or drilling in Iron. And the wet Grindſtone, though it want Heat to give a new Polarity, yet probably it may wear off thoſe parts of the Iron in which the old did inhere, and ſo render it ſimple again.

As to the 4th, Whether Braſs or Copper will, as well as Iron, give a N. Polarity to a Drill; this cannot well be try'd; ſince the very making, if it be well hardned, will certainly give it. Wherefore

5. The Drill Mr. *Hunt* made could not, if well harden'd, according to what I can find, be indifferent to either Pole.

6. I ſuppoſe the Drill having a S. Pole given it by the Magnet, could not be heat ſo far upward toward the Box by drilling, as it had received Polarity: So that ſuppoſing the very top to be ſufficiently heat, and to have loſt its South Polarity, it has it ſtill ſupplied from the parts upwards Magnetick Virtue, as I always obſerved, tending ſtill toward the Extreams: (as appears from the Edges of the Arms of a Loadſtone, which the Virtue ſeeming from the Surface of every ſide there to unite, takes up much more Filings of Iron than the middle can.)

7. As to the Concluſions, *Firſt*, That a Drill is naturally a North Pole, I ſuppoſe may be true, but it is contrary directly to what is affirmed in the fifth Paragraph, *viz.* That the Drill made by Mr. *Hunt*, was indifferent to either Pole, *&c.* And I ſuppoſe that bare drilling might be able to give a Polarity to a Drill, if it could be made indifferent, as well as filing does, if the Drill be uſed ſo briskly as to be made as hot as the File makes the Iron. *Secondly*, That though a S. Pole given by the Magnet cannot be taken off by the Heat of a brisk Motion (as that of drilling); which yet by the Experiment of my Knife ſeems to be contradicted; yet perhaps the Heat may be great enough to produce a Polarity in an indifferent piece of Iron; as was before ſaid to be done, in little indifferent Drill-like pieces of Steel, by filing.

I have lately try'd ſeveral ſmall Experiments referring to what I before have ſaid; but with ſuch Uncertainty, that as I find many things in my Tryals contrary to what others have ſeem'd to find; ſo I queſtion whether any thing I have ſaid will univerſally bear the Teſt. So that happening to be hindred (as I am like to be) more than uſually, with other Concerns, I am forc'd at preſent to want that Satisfaction I promiſed my ſelf, till my ſelf hereafter ſhall endeavour, or ſome more able,

in

in the mean time (if at leiſure) ſhall be pleaſed to give us.

V. *Part of a Letter from the Reverend Mr.* George Lewis, *at* Fort St. George; *to the Reverend Dr.* Arthur Charlett, *and the late Dr.* Edward Bernard; *concerning ſome Indian Manuſcripts, lately ſent to the Univerſity of* Oxford.

Reverend Sirs,

IN purſuance to your joint Letter, bearing Date the 3d of *July*, 1695. I have procured you ſome of the Manuſcripts of theſe parts, wherein it hath been my Care to get ſuch as were of good Note and Eſteem among themſelves. They are in ſeveral Languages and different Characters. The Names of the Particulars I ſend you in a Note encloſed. If hereafter it ſhould be my Fortune to meet with any of their ſacred Books, as the *Vedum*, *Vedantum*, *Shaſtrum* or *Porane*; I ſhall take care to ſend them when a Convenience offers.

There comes by the *King William* Three Volumes of *China* Books, ſtamped on Wood, which is their ſo much vaunted way of Printing. Theſe are ſent to Mr. *Gilbert Dolben* by his Brother here: And Three ſent to Dr. *John Evans*, by a Friend come on the *Madraſs* Merchant. I preſume, they'll be all preſented to your Univerſity. Of theſe you may have what Quantity you ſhall command, Books being plentiful in *China*.

Mr.

Mr. *Elihu Tale*, late Governor of this Place, got a learned Bramine to tranſlate out of the *Sanſcreet* into the *Tulinga* Language ſome of their Sacred Books. But the Bramine in ſome meaſure abus'd him. However, he tranſlated the whole Body of the *Gentio* Laws into the *Tulinga*; as likewiſe their Account of the Creation of the World, taken out of the *Shaſtrum* or *Porane*, I am not certain which. This Book is writ in a fair Character, and upon good Paper, and upon his arrival in *England*, is deſign'd a Preſent to your Univerſity.

A Catalogue of the Books ſent.

A. The *Ramainum* or Hiſtory of *Ram*, in the Sanſcreet Language, and the Grandum Character, *i. e.* the Character us'd by the Malabar Bramines.

A 2. The *Ramainum* in the modern Gentio or Tulinga Language.

B. The *Bohar'tum*, or Hiſtory of *Virada Raz*, and other wiſe Princes in theſe Parts. An ancient Hiſtory. Tulinga.

B 2. Other parts of the *Bohar'tum*. Tulinga.

B 3. More parts of the *Bohar'tum*. Tulinga.

C. *Parma Teogee Velaſum*, a Book treating of Religious Matters, and held in great Eſteem. Tulinga.

D. *Kiſna Velaſum*, or the Hiſtory of *Kiſna*, in the Arwa or Malabar Language and Character.

E. Contains three Books in the Tulinga. 1. *Anooſha Sanikum.* 2. *Aiſh Rama Baſum.* 3. *Aiſhwa Meda Parwum.*

F. A Gentio Book writ at the Requeſt of an Engliſh Chief in thoſe parts. Containing 1. The Tulinga Alphabet, and their way of compounding and making Syllables.

2. An

2. An erroneous and imperfect Account of the Coaſt of *Coromandell*, and of the Kings of *Golconda*.

3. Some of their ancient Stories or Fables; all in a fair Character.

In the Gentio Book, writ on Paper, are encloſed ſeveral looſe Papers, as

1. *Aurang-Zebe*'s Picture, with the Year of the *Hegira* he was born in.

2. A Lion in Arabick Characters, with the plain Reading.

3. An Arabick Writing, ſaid to be found in *Alexander*'s Cloſet.

4. Several Specimens of the beſt Hands here, in the Perſian Language.

5. Certain Characters upon a Seal, underſtood by no body in theſe parts.

6. Several Hymns or Sacred Songs in the Perſian and Hindoſtan Language, ſung in Honour of *Huſen* and *Haſan*, Suns of *Alee*, by the *Eranee* Mohametan, on the firſt ten Days of the Month *Meharum*, when they commemorate the Martyrdom of thoſe two Saints.

7. A Letter in the *Shekaſteh* or ſhort Writing, the uſual Hand Perſian Letters are writ in, which for the Excellency of the Character, I thought fit to ſend among the reſt.

The above-mentioned Reverend Dr. Arthur Charlett, *Maſter of* Univerſity-College, Oxford, *having* (*as on many other Occaſions*) *favoured the Royal Society with a Sight of theſe curious Manuſcripts, it appeared by a Sample or Specimen of the Leaves and Fruit of the* Ampana *Hort. Mal. Tom.* 1. *p.* 13. *Fig.* 10. or Palma Malabarica, floſculis ſtellatis, fructu longo ſquammato *D. Syen. ib. Or* Palma Coccifera folio plicatili flabelliformi

formi major. Ampana *H. M.* Raii *Hiſt. p.* 1366. *ſhown to the Society by Mr.* James Pettiver, *one of their Members, that the ſeveral Leaves of all Leaves of theſe Books were made of the Leaves of this* Palm *wrote on by a Stile.*

VI. *An Account of what happened to a Child on ſwallowing two Copper Farthings. Communicated by Dr.* Edward Baynard, *Fellow of the College of Phyſitians.*

I Living then in *Worceſter*, my Son *William Underhill*, aged about Three Years, ſwallowed by accident two Copper Farthings, but half a Year one after the other. Upon the firſt Farthing, he eat nothing for ten Days, and complained of a great Pain at his Stomach, and drivel'd as if he had been ſalivated; and often ſaid he had a nauſeous venomous Taſte in his Mouth, the Farthing not coming from him in half a Year. After the ſwallowing of the ſecond Farthing he began by Degrees to loſe his Limbs, his Breaſt growing narrow, and the Child Conſumptive; who was after perfectly cured by the Bath, and his Breaſt dilated and grew broad as before. This happening about Ten Years ſince, theſe are moſt of the Particulars I can remember. Witneſs my Hand,

Her. Underhill.

VII.

VII. Curvæ Celerrimi Deſcenſus *inveſtigatio analytica excerpta ex literis R. Sault, Math. D°.*.....

CUM me noviſſimè Societate tua dignatus es, collocuti ſumus de *Curva Celerrimi Deſcenſus*, Mundo Mathematico, Domino Bernoulliano, propoſita. Interq; cætera mentionem feciſti de demonſtrationis meæ publicatione quam e pluribus retro menſibus inveni: quamvis autem problema illud nunc obſoletum videatur, libentius tamen publici juris faciam, quia celeberrimus Leibnitius omnes Mathematicos, hujus problematis ſolutionis compotes, enumerare ſuſcepit, necnon ne teſſeram obſervantiæ meæ tibi ipſi debitam, omittam.

Sit *AP* (Fig. 15.) linea Horizontalis; *P*, punctum a quo corpus grave deſcendit, per Curvam lineam quæſitam *ADE*, *C* & *D* puncta duo infinitè propinqua, per quæ corpus deciſurum ſit, *CD* recta duo puncta connectens, *DC* & *sC*, *DF* & *SG*, *FS* & *GC* vel *sH*, momenta curvæ, abſciſſæ, & ordinatim applicatæ reſpective. Capiatur $Dr = Ds$ & $tC = BC$.

Quoniam in lineolis naſcentibus, tempus eſt ut via percurſa directè & velocitas (i. e. in hoc caſu, ut radix quadrata altitudinis corporis deſcenſi) inverſè, per Hypoth. $\frac{Ds}{VQD} + \frac{sC}{VQF}$ = Tempori *Minimo*. Et quia velocitas in punctis æqualtis *S* & *B* per curvam *DsC* & rectam *DBC* eadem eſt, tempus per *DC*, quod evidenter *minimum* eſt, erit ut $\frac{DB}{VQD} + \frac{BC}{VQF}$; æquentur ergo hæc tempora, & $\frac{Ds}{VQD} + \frac{sC}{VQF} = \frac{DB}{VQD} + \frac{BC}{VQF}$. hoc eſt $\frac{DB-Ds}{VQD} = \frac{sC-EC}{VQF}$ vel $\frac{Br}{VQD} = \frac{ts}{VQF}$.

Sed triangula Evaneſcentia *Brs*, *Bts* æquiangula ſunt triangulis *DsF*, *HsC*; Erg. $\frac{Bs}{Ds} = \frac{Br}{sF}$ & $\frac{ts}{Hs} = \frac{Bs}{st}$ componan-

tur hæ duæ rationes æqualitatis & $\frac{B \cdot r}{Ds \times Hs} = \frac{ts}{sF \times st}$. Ex æquo $\frac{VQD}{sF \times st} = \frac{VQF}{Ds \times Hs}$. Quandoquidem autem quidvis ex Elementis æquabiliter fluere ſupponatur, ponamus $DS = SC$ & evadet ſimpliciſſima Curvæ expreſſio $\frac{VQD}{sF} = \frac{VQF}{Ds}$. ubiq; i. e. in puncto flexuræ Curva ſemper erit in ratione compoſita velocitatis directé & momenti applicatim ordinatæ, inverſe. Sit $\dot{x}$, $\dot{y}$ & $\dot{z}$ fluxiones abſciſſæ, ordinatim applicatæ, & curvæ reſpective, $\frac{\dot{x}^{\frac{1}{2}}}{\dot{y}}$ conſtans eſt, ut ſupra. Erg. $\frac{\dot{x}^{\frac{1}{2}}}{\dot{y}} = 1$ ſed poſſuimus $\dot{z}$ $(= \sqrt{\dot{x}\dot{x} + \dot{y}\dot{y}})$ conſtans. Ergo ut hæc unitas conſtans ſit & dimenſiones debitas retineat $\frac{\dot{x}^{\frac{1}{2}}}{\dot{y}} = \frac{a^{\frac{1}{2}}}{\sqrt{\dot{x}\dot{x} + \dot{y}\dot{y}}}$, & poſt reductionem, $\dot{y} = \frac{\dot{x}^{\frac{1}{2}} \dot{x}}{\sqrt{a - x}}$ Expreſſio notiſſima Cycloidis *PEL. Q. E. F.*

VIII. *A Catalogue of Books lately printed in* Italy.

COllectanea Monumentorum veterum Eccleſiæ Græcæ ac Latinæ quæ hactenus in Vaticana Bibliotheca delituerunt. Laurentius Alexander Zacagnius Rom. Vaticanæ Bibliothecæ Præfectus, e ſcriptis codicibus nunc Sig. primum edidit, Græca Latina fecit notis illuſtravit 4to. Romæ 1698.

Oſſervationi Hiſtoriche ſopra alcuni Medaglioni del Sig. Cardinale Carpegna dell' Abbate Filippo Buonarotti. 4to. Roma 1698.

Ema-

Emanuelis Schelſtrate Bibliothecæ Vaticanæ Præfecti Antiquitas Eccleſiæ, tomus primus continens Opus Chronologicum, folio Romæ 1692.

——— Ejuſdem tomus ſecundus opus Geographico-Hierarchicum. folio Romæ 1697.

Joſephi Saenz Cardinalis de Aguire Collectio maxima Conciliorum Hiſpaniæ & novi Orbis. fol. 4 Vol. Romæ. 1693.

Philippi Bonanni Soc. Jeſu, Numiſmata ſummorum Pontificum Templi Vaticani fabricam indicantia. fol. Romæ. 1696. cum figuris.

Michaelis Angeli Cauſei De la Chauſſe Muſeum Romanum ſive Theſaurus eruditæ Antiquitatis. fol. Romæ. 1690. cum figuris.

Joannis Ciampini Vetera Monimenta de Operibus Muſivis. fol. Romæ. 1690.

——— Idem de ſacris ædificiis à Conſtantino magno conſtructis, cum figuris. fol. ibid. 1693.

——— Ejuſdem ſacra Hiſtorica diſquiſitio de duobus emblematibus quæ in Cimelio eminent. Cardinalis Gaſparis Carpinei aſſervantur in quorum altero præcipuè diſceptatur an duo Philippi Imperatores fuerint Chriſtiani. 4to. Romæ. 1691.

Il Tempio Vaticano & ſua origine con gli edificii piu conſpicui antichi, & moderni fatti dentro, & fuor di eſſo deſcritto dal Cav: Carlo fontana Architetto di eſſo Ital. Lat. fol. Roma, 1694. con. figure.

La Hiſtoria Univerſale provata con monumenti, e figurata con ſimboli degli antichi dal Signore. Canonico Franceſco Bianchini Veroneſe. 4to. Roma, 1697. con figure in rame.

Proſpettiva ad uſo de Pittori & architetti del Padre Andreo Pozzi. S. J. fol. Roma, 1693. con figure.

Siria ſacra Deſcrittione Iſtorico-Geografico-Topografica delle due Patriarcali Antiochia ed Jeruſalemme, di-

quelle

quelle d'Aleſſandria, e Coſtantinopoli, e de 'Primati di Cartagine,e d'Etiopia dell'Abbate Biaggio Terzi da Laveria. Fol. Roma, 1695. con figure.

Hieronymi Vitalis Clerici Regularis Theatini Lexicon Mathematicum hoc eſt rerum omnium ad Univerſam fere Matheſim quà late patet ſpectantium collectio & explicatio. 4to. Romæ, 1690. cum figuris.

Joannis Franciſci Vannii Soc. Ieſu Inveſtigatio momentorum quibus gravia tendunt deorſum 8vo. Romæ. 1693.

Gli antichi Mauſolei Romani & etruſchi trovati in Roma & altri luoghi celebri nelli quali ſi contengono molte erudite memorie diſſegnate da Pietro Santi Bartoli. folio Roma, 1697.

Le antiche Lucerne figurate, raccolte dalle caue ſotterranee & grotte di Roma nelle quali ſi contengono molte erudite memorie diſſegnate da Pietro Santi Bartoli, colle oſſervationi di Gio. Pietro Bellori. fol. Roma, 1685.

Pitture Antiche del ſepolcro de Naſoni diſſegnate da Pietro Santi Bartoli & illuſtrate colle note di Gio. Pietro Bellori. Fol. Roma, 1682.

Georgii Baglivi Doctoris Medici de praxi medica ad priſcam obſervandi rationem revocanda libri duo, accedunt Diſſertationes novæ. 8vo. Romæ, 1696.

Proſperi Mandoſii Theatrum in quo maximorum Chriſtiani orbis Pontificum archiatros ſpectandos exhibet. 4to. Rome, 1696.

Caroli Joſephi Imbonati Ord. Ciſterc. Chronicon Tragicum, ſive de eventibus Tragicis. 4to. Romæ. 1696.

LONDON: Printed for *Sam. Smith*, and *Benj. Walford* Printers to the Royal Society, at the *Prince's Arms* in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM
NATURAL HISTORY.

B

C

D

Fig. 1

A

E

f. 4

f. 3

A

f. 2

C B

BRITISH MUSEUM
NATURAL HISTORY.

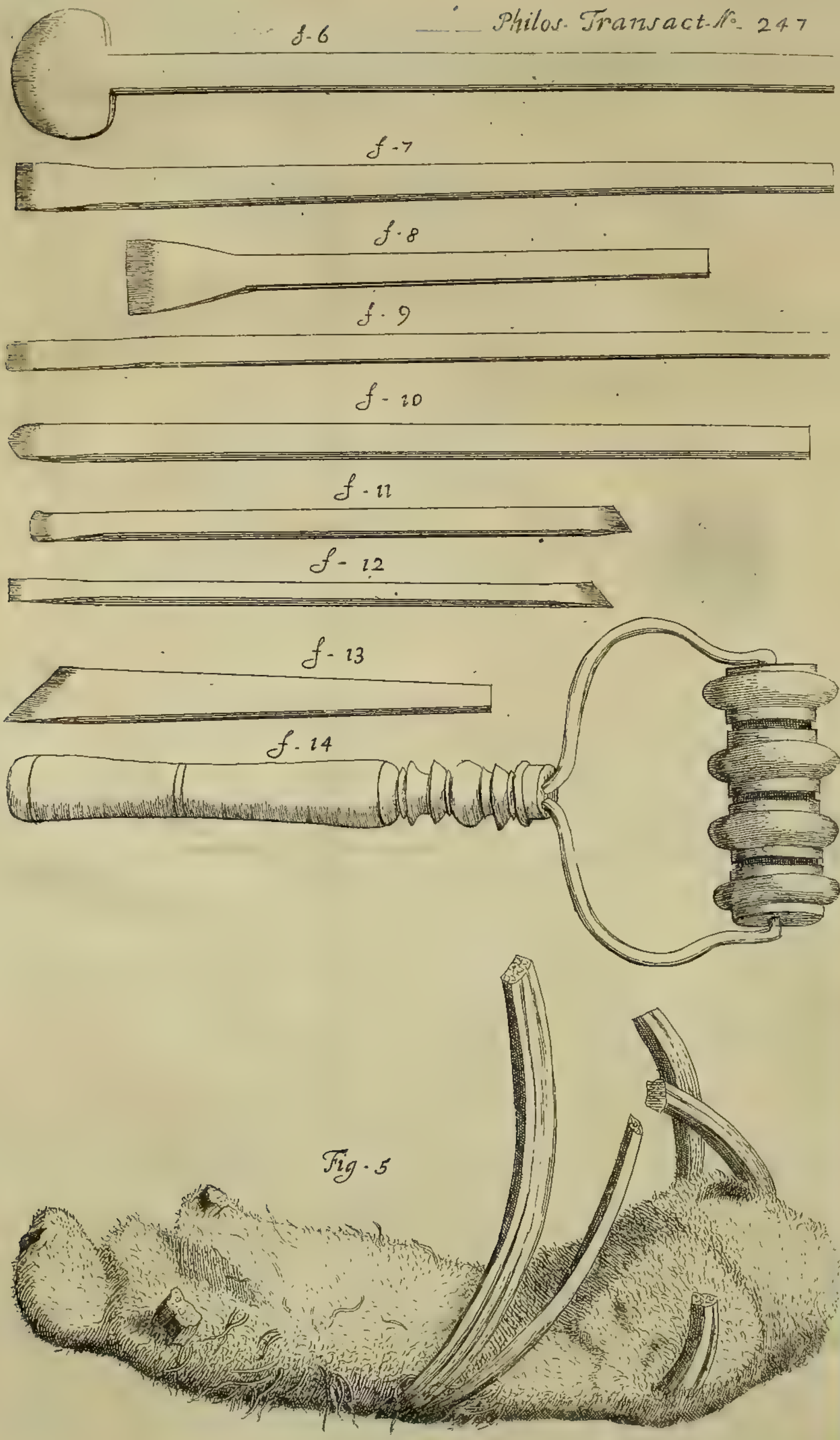


Fig. 5

PHILOSOPHICAL TRANSACTIONS.

For the Month of December, 1698.

The CONTENTS.

I. *Part of a Letter from* Mr. Geoffroy, *to* Dr. Sloane, *from* Paris, 21 Dec. 1698. *N.S. concerning the Mineral Waters at St.* Amand *near* Tournay *and* Valenciennes. II *Some Experiments and Observations concerning* Sounds. *By* Mr. Walker, *late of* Brasen Nose-College, Oxon *Communicated by* Dr. W. Musgrave, *Fell. Coll. Phys. and R. S.* III. *Further Experiments about Freezing. By* Mr. Desmasters *Communicated by* Dr. Musgrave. IV. *An Account of a Stone bred at the Root of the Tongue, and causing a Quinsie. Communicated by* Mr. Bonavert. V. *Part of a Letter from* Dr. Musgrave, *Fell. Coll. Phys. and R. S. to* Dr. Sloane; *concerning a Piece of Antiquity lately found in* Somersetshire. VI. *A Letter wherein is given an Account of the Catalogues of Manuscripts lately Printed at* Oxford. VII. *A further Account of the Contents of the* China *Cabinet, mentioned last Transaction, p.* 390. *By* Hans Sloane, *M.D.* VIII. *An Account of a Book, Mu-*

ſeo di Piante rare della Sicilia, Malta, Corſica, Italia, Piemonte e Germania, &c. di Don Paolo Boccone, &c. with additional Remarks by Mr. John Ray, *F.R.S.* IX. *An Index to the Philoſophical Tranſactions, from* Numb. 236, *to* 247. *inclusive.*

I. *Part of a Letter from Mr.* Geoffroy, *to Dr.* Sloane, *from* Paris, 21 Dec. 1698. *N.S. concerning the Mineral Waters at St.* Amand *near* Tournay *and* Valenciennes.

THere has been found a Mineral Water, called, *St. Amands-Water*, which has been very much in uſe the laſt Summer and Autumn, in all ſorts of Sickneſſes, rather for its Novelty, than for its great and extraordinary Properties.

Fifteen Years ago the Country-men began to ſeek ſome Vertues in that Water, but ſince the end of the laſt War, they have imputed to it the greateſt Properties. Moſt ſick Perſons are willing to drink ſome, thinking to ſwallow in great Glaſſes their Health with that Water. Abundance of People have been upon the Place for drinking it there, or for bathing in its Mud, and others have been contented to bring ſome to their Houſes to drink.

The Curioſity of ſome Perſons has engaged me to make ſome Experiments upon that Water; and here is an Account of the Mineral Fountain, of the Water's Quality, of the Experiments upon it, and of the Vertues that they attribute to it.

This Mineral Water is called *St. Amand's Water*, becauſe its Spring is in the Land depending on the Abby of the ſame Name, of the Order of St. *Benedict*, in the Dioceſe of *Tournay* in *Flanders*. This Spring is ſituated Two Miles from that Abbey, Four Leagues from *Tournay*, Three Leagues from *Valenciennes*; but the Fountain is called particularly, *La Fontaine du bouillon*, for the impetuous boyling of that Springing Water.

This Fountain is ſituated in a ſhallow and Marſhy Ground; the Baſon of the Spring is Four hundred and fifty Foot ſquare, there is in the bottom of that Baſon the Mud of Twenty Foot

Foot deep; beyond that they find the Sand, which ſometimes is very moving, and at ſome other times is very firm. Very often this Fountain caſts up a great Quantity of Sand: and laſt Year in a little time it caſt up more than Sixteen Cart Loads of it, by the which all the Baſon was bordered.

There is to be found Three ſorts of Earth, the firſt and ſuperficial is black, and burns as *Turf* with the ſame Smell. The Second is white, and the Third has the ſame Colour as the Slate. Theſe Two laſt ſorts of Earth do give by *Lixivium*, a Salt like *Sal gemmæ*.

This St. *Amand's-Water* in its Spring is clear and luke warm, and appears much hotter at Night and in the Morning, than the reſt of the Day. It has the Smell and Taſte like ſtanding Water. If it is expoſed to the Air, it loſes its Smell and its Taſte in a ſhort time. By that Facility to loſe its Taſte and Smell, one may judge that it has a Sulphur very volatile; and for that great volatility and ſubtilty it is almoſt impoſſible to make any Experiments upon it.

Theſe are the Experiments that I have made upon the Water that has been brought to me.

This Mineral Water has the ſame Weight as the *Seine* River-water. It altered not the Colour of Sirrup of Violets, nor the Tincture of *Turne Sol*, Lime Water, the Oyl of Tartar, the Volatile Spirit of *Sal Armoniac* and Harts Horn have whited that Water, and have made in it a light Coagulum.

This Water, mixt with the Diſſolution of Armoniack Salt, has not given any ſmell. It has not alter'd the Infuſion of Galls. Mingled with the Solution of Vitriol, has troubled it a little, and has given a greeniſh Colour, and at length it precipitated a Yellow Powder.

Acid Spirits have not fermented at firſt with that Water, but afterwards it has made ſome little Bubbles, which remained to the ſide of the Glaſſes, wherein were contained the Liquors.

I have diſtilled five pints of that Water; the diſtilled Water has not had any Taſte nor Smell, and it has not changed the Tincture of *Turnſol*, neither the Lime-Water. There remained from that Five Pints (or One hundred and ſixty Ounces) Seventy Grains of Reſidue; the which, by *Lixivium* has given to me Fifty-five Grains of grey Earth, and Fifteen Grains of white Salt, almoſt like *Sal gemmæ*.

The

The reſidue of the evaporated Water put upon the burning Coals, has not caſt any Smoak, neither has made any Detonation; the Spirit of Nitre pour'd upon it, has very much fermented; the Spirit of Wine has not extracted any Tincture from that reſidue.

One may conclude by all thoſe Experiments, that this Water has not any Acidity, it participates not of Vitriol nor of Alum; and there is in it but a little Quantity of the white Earth, and leſs alſo of Salt very like Sea-Salt.

They are the parts of Earth and Salt, which ſhew themſelves in the Mixture of the Lime-Water, *&c.* of fixed or volatile Alcalis.

They are the ſame parts which begin that light Fermentation in the Mixture of Acid Spirits; but that Fermentation is imperfect becauſe of the little Quantity of the Earth, which is drowned in ſo great a Quantity of Liquor; in effect when the Water is evaporated, the Acid Spirits do ferment very much with the reſidue.

It appears by the Smell of that Water, that it contains a Sulphur very ſubtle, which diſſipates its ſelf very eaſily, and which is not ſenſible in the Experiments. 'Tis nevertheleſs to be attributed to that Sulphur, the principal Effects which they do attribute to that Mineral Water, as of helping in the Palſy, *&c.* in other ſorts of Diſtempers where the nervous Gender is attack'd, in Short-breath, and in all Affections of the Lungs; and of remedying many other Infirmities which are cauſed by the ſharp Ferments, the which are ſweetned by that Water. For the other Properties of it, as of purging, of taking away Obſtructions, of tempering the hot Intrals, *&c.* it may have the ſame Effects with common Water being drunk abundantly.

One may drink many Glaſſes of this Water beginning by Four, Six or Eight every Morning, and augmenting till Twelve, Eighteen, Twenty or more, according as the Stomach is able to ſupport it. This Water paſſes readily by Urine, and many Perſons are purg'd by it. Sometimes one may mix with it ſome Diuretick Salt, to make it paſs more freely, and for rendering it more de-obſtructive. At other times one may put ſome Manna or other things for making it more purgative. One may waſh alſo in the Mud of that Fountain, according to neceſſity.

II. *Some*

II. *Some Experiments and Obſervations concerning* Sounds. *By Mr.* Walker, *late of* Brazen-Noſe-College, Oxon. *Communicated by Dr.* W. Muſgrave, *Fell. Coll. Phyſ. and R. S.*

INtending to try the Swiftneſs of Sounds, I provided a Pendulum which had Two Vibrations in 1″ of Time; this I carefully adjuſted at a Watch-maker's; it was a Piece of ſmall Virginal Wire with a Piſtol Bullet at the end of it, the Length of it was 9 $\frac{5}{16}$ Inches to the middle of the Bullet: I firſt made it about $\frac{1}{15}$ of an Inch longer, *viz.* $\frac{1}{4}$ of the length of a Pendulum that vibrates 2*ds*, but found it too ſlow, which I expected, becauſe *Merſennus* tells us, [*Harm. Univ. l.* 2. *pro.* 26.] that Two Pendulums had their Vibrations one twice as quick as the other, whereas one was 2 Foot, the other 8 $\frac{1}{2}$ Foot contrary to what *Galilæo* demonſtrates would happen if the Air did not hinder; who proves that Pendulums of different lengths [would *in Vacuo*] have the times of their Vibrations in ſub-duplicate Proportion to their lengths.

I took this Pendulum, and ſtanding over againſt a high Wall I clapt Two ſmall pieces of Boards together, and obſerved how long it was e're the Echo return'd, and I removed my Station till I found the Place whither the Echo return'd in about half a Second. But that I might diſtinguiſh the time more nicely, I clapt every Second of Time Ten or Fifteen times together; ſo that by this Means I could the better diſcover whether the Diſtances betwixt the Claps and the Echoes, and the following Claps were equal. And though it be very difficult to be exact, yet I could come within ſome few Yards of the Place I ſought for, thus: I obſerved the Two Places where I could but juſt diſcover that I was too near, and

where I was too far off; and from the Mid-way betwixt them I measured to the Wall, which Measure doubled, was the Space that the Sound moved in half a Second.

Here follow the Numbers of *English* Feet which a Sound moved in one Second of time at several Trials.

		Feet.		*Feet.*
Mersennus	1.	1474	9.	1292
	2.	2050	10.	1378
Florentine *Exper.*	3.	1148	11.	1292
Mr. Boyle's *above*	4.	1200	12.	1185
	5.	1256	13.	1278
	6.	1507	14.	1290
	7.	1526	15.	1200
	8.	1150		

I have here added Four other Numbers; Two of them *Mersennus* mentions, but the first is that which he relies upon, being the Result of many Experiments that he tried; he speaks of it in his *Ballist. prop.* 39. and elsewhere. The Second is grounded upon an Experiment which he did not try himself, and he questions whether the Observation were accurate: He says, the Sound of a great Canon, which was heard in the Night 11″ after firing, passed every Second 1920 *French* Foot [*Tom.* 3. *pa.* 163.] The Third you have in the Book of the *Florentine* Experiments: The Academy *del Cimento* caused Six Harquebusses and Six Chambers to be fired one after another at the Distance of 5739 *English* Feet, and from the Flash to the Arrival of the Report of each was 5″: And repeating the Experiment at the mid-way, the Motion was exactly in half the time.

The

The Fourth Mr. *Boyle* mentions in his Eſſay of Languid Motion, *pa.* 24. where he ſays, he has more than once diligently obſerved, that the Motion of Sound paſſes above 400 Yards in 1″.

The reſt of the Numbers are collected from Experiments which I tried in ſeveral Places. When the Fifth was tried there was ſome Wind ſtirring, though not much. The Sixth, Seventh and Tenth were tried in a clear calm Morning: The Sixth and Seventh were tried in Two places in St. *John's Grove.*

The Twelfth Experiment was tried Two ſeveral Mornings, the Place where I ſtood was about 395 Yards from the Wall, and the Echo returned in 2″. The Thirteenth was tried at the Diſtance of 213 Yards from the ſame Wall. And the Fourteenth another Morning at 215 Yards Diſtance from it; in each of them the Sound was reflected in 1″.

The Eighth Experiment was tried in St. *John's-Cloiſter*; and the Fifteenth in *New-College-Cloiſter*, where the Sound was toſſed from one end to another, forward and back again ſeveral times, like that which *Merſennus* obſerved at *Milan*, where he thinks his Voyce was reflected thus at leaſt Ten times, [*Reflex*, *ch.* 20. *p.* 164.] In *St. John's-Cloiſter*, which is 104 Foot and 7 Inches long, I ſtood at one end, and the Sound was repeated 11 times in 2″. On the North ſide of *New-College-Cloiſter*, which is 160 Foot and 8 Inches long, I ſtood at one end and a Clap was repeated 8 times in a little more than 2″; I gueſs there were 7½ Echoes in 2″. From the Number of Echoes here in 2″, I computed the Swiftneſs of the Sound.

Merſennus and the Academy *del Cimento* conclude, That Sounds are all of the ſame Quickneſs, whether they be great or ſmall, and whatever Temper the Air is of, though *Merſennus* was once of another Mind: But *Kircher*, from ſeveral Experiments, infers, That loud

Sounds move quicker than little ones, [*Phon. pa.* 14.] Dr. *Plot* alſo tells us, the Echo returned the Sound of a Piſtol much quicker than a Voice; and that it repeated more Syllables in the Night than in the Day, [*Oxf. pa.* 7.] whence it follows that the Sound moved ſlower in the Night than in the Day. *Kircher* ſays, that an Echo which in the Night repeated Fourteen Syllables, repeated but Seven of them in the Day, [*Muſurg. li.* 9. *pa.*244.] which ſeems very odd. Becauſe there ſeems to be ſo great Affinity betwixt the Undulation of Water, and the Propagation of Sound, therefore the Academy *del Cimento* tried ſome Experiments about the firſt; and they tell us, that the larger the Stone is which is thrown into the Water, and the greater the Force, by ſo much is the Undulation ſwifter: Though *Gaſſendus* had before affirmed, that the Undulations of Water are all equally ſwift. And I have often obſerved, that when a Stone has been thrown into the Water, the further the Undulations removed from the Center, the greater was the Diſtance from one another, even of thoſe that rolled the ſame way: So that the Motion of each precedent Undulation was quicker than that which followed it. If this may be allowed for any Argument, it makes for *Kircher*'s Opinion.

By ſome of thoſe Experiments that I tried, I am inclined to think, that the Sound moved quicker when it was Calm, than in a Wind, even when the Sound moved half way with the Wind. Some other Experiments ſeem'd to me to confirm an Opinion of *Kircher*'s, who ſays, That a Sound moves ſwifter at firſt than afterward, as is uſual in other violent Motions.

There is ſeldom any Echo, where there is not ſome Wall, Wood, Bank, or ſuch like, directly oppoſite, that may reflect the Sound to the Perſon that makes it; but in *St. John's Grove*, if you ſtand near the Gate leading from

from the College to the Grove, and clap, the Echo will return to you from the *Ball Court*, though a Line drawn from you to the *Ball-Court* be not perpendicular to the Wall there, but as much oblique as the Line *AB* in *Fig.* 1 is to the Line *BC*; where *A* represents the Gate, *BC* the *Ball-Court-Wall*, and *BD* another Wall. Or if you stand at *E* the Corner of the Grove next to *Trinity*, and clap, the Echo will return to you from the *Ball-Court*.

In the same Grove I stood about Twenty Yards from the same Gate, and the Gate being shut, I clapt, and at other times stamped, and the Echo returned from the Gate as loud, if not louder, than the Clap or Stamp.

An Echo reflected from a Gate or Door has usually a baser and duller Sound than that which is returned from a Wall, this being much brisker.

As I have been walking towards a Wall, I have clapped my Hands together several times, and I could distinguish the Echo from the Clap, till I came within Seven or Eight Yards of the Wall.

In the Cloisters, where, as was said before, the Echo was repeated several times, the first Repetition seemed to be slower than the second or the third; but of all the Repetitions, besides the first, the subsequent seemed slower than the precedent.

I have observed the Tossing of a Sound forward and back again, in very many Places where there are parallel Walls; and where the Distance of the Walls is less, there the Echoes follow one another quicker.

Wheresoever a Sound was thus tossed betwixt Two Walls, if I stood about the middle, I could hear the Sound twice as quick, that is, twice as often repeated in 1", as if I stood near one Wall; the Sound being reflected to me from both ends, when I stood in the middle.

In

In *Trinity Ball Court*, which is repreſented by *Fig.* 2. when I ſtood and clapt at *B*, Three or Four Yards from the end of the Wall *C*, or at *A*, which is oppoſite to *B*, the Sound was toſſed betwixt the oppoſite Walls; but not half ſo long time as when I ſtood betwixt the Walls. In Places where there are parallel Walls, not above Six or Eight Yards aſunder, as in *Trinity Ball-Court*, and at the Entrance into *St John's-Grove*, &c. I have heard the Echoes of a Clap following one another diſtinctly enough; but there the Echoes of a Muſical Note, which was longer than a Clap, were ſo confuſed, that they ſeemed one continued long Sound: which makes me think, that the Echo in ſome Vaults, is nothing elſe but the Sound toſſed betwixt the Side-Walls, and betwixt the Top and Bottom. This alſo makes me conjecture, that the Reaſon why Stringed Muſical Inſtruments give a greater and longer Sound to the Strings, than if the Strings were fixt to a ſingle Board, may be this; becauſe the Sound is toſſed from Side to Side in the Belly of the Inſtrument.

III. *Further Expetiments about Freezing.* By *Mr.* Desmasters. *Communicated by Dr.* Musgrave.

IN the Account given *Numb.* 245. *p.* 384. concerning the Expansion of Water by Freezing, the Water then made use of in these Tryals, was, a sort of rough Pump-Water; which, according to what Tryals have been made with it, does, upon the effusion of Oyl of Tartar *per deliquium*, immediately turn milky and turbid: and considering the Ice made of this Water was a sort of very rarefied white Ice, I was thereby inclined to try whether River Water, which would readily mix with Oyl of Tartar without the least precipitation, would upon freezing be expanded to the height of the Pump-Water, above-mentioned.

In order to which, I filled a Glass Tube, of almost an Inch Diameter, with River-Water to the height of Six Inches (as I had done in the former Tryal) and putting it to freeze in a Mixture of Snow and Salt, it gained but $\frac{1}{8}$ of an Inch after it was frozen, whereas the Pump-Water got $\frac{7}{8}$ of an Inch.

I observed that while the River-Water was freezing, Bubbles rose from the bottom of the Tube much at the same rate as in the freezing of Pump-Water.

I likewise took boyled Pump-Water, and having filled a Tube with it to the height of Six Inches, and set it to freeze as before, it rose hardly to $\frac{1}{8}$ of an Inch above the Mark; when as the same Water un-boyl'd rose $\frac{7}{8}$.

IV. *An*

IV. *An Account of a Stone bred at the Root of the Tongue, and causing a Quinsie. Communicated by Mr.* Bonavert.

THE Stone *Fig.* 3. came from *Tho. Wood* of *Nepe-care-street* in *Wrotham,* he was troubled with a Quinsie, he neglected Advice till he could hardly swallow any Liquid; and when I went to see him, I found the Tumour tend to Suppuration inwardly about the Root of his Tongue on the Right Side, though it was almost as big as an Egg outwardly; but without any Sign of Suppuration there: Wherefore I ordered him Maturating Gargles; and the next Day sent my Man, and bid him advise him to endeavour to break it with his Finger, which the Man effected, and brought out of his Mouth near the Quantity of a quarter of a Pint of Matter, and with it at last the Stone; he had likewise a *Ranula,* and before he had broke the Tumour, and spit out the Corruption he could hardly speak. I believe this Stone to be of the same Nature as those generated in the Kidneys and Bladder.

The Weight of this Stone in Air is 7 gr. *The Weight of the same in Water is* $3\frac{1}{2}$; *and its specifick Weight compar'd with Water is near as* $1\frac{2}{10}\frac{1}{3}$ *to one.*

V. *Part*

V. *Part of a Letter from Dr.* Musgrave, *Fellow of the College of Physicians and R. S. to Dr.* Sloane; *concerning a Piece of Antiquity lately found in* Somersetshire.

I Encloſe, to you, the Figure (*ſee Fig.* 4.) of a curious piece of Antiquity, lately found near *Aſhelney* in *Somerſetſhire*; the Place where King *Alfred* built, as *Milton* affirms, a *Fortreſs*: But according to *William* of *Malmsbury*, a *Monaſtery*; in Memory (as ſome have thought) of his Deliverance, obſcure Retreat to that Place, and Concealment in it, from the *Danes*.

The Subſtance is in the Poſſeſſion of Col. *P.* of *Fairfeild* in the ſame County; by whoſe, Permiſſion, I had the Sight of it. 'Tis of the ſame Length and Breadth with the Figure: the Work very fine; ſo as to make ſome Men queſtion its true Age: But in all probability, it did belong to that great King, it is ſo well repreſented in the Figure, that a ſhort Deſcription will ſuffice.

The Edge is thin, as far as the Letters. The Letters are on a Plane riſing obliquely. All within the inner Pyramidal Line is on a Plane equi-diſtant from the Reverſe. The Repreſentation (in that upper Plane) ſeems to be of ſome Perſon in a Chair. It is in Enamel, cover'd over with a Cryſtal; which is ſecured in its place by the little Leaves coming over its Edges. In the Reverſe are Flowers engraved. The whole piece may be of the Weight of Three Guineas. The Chryſtal and Enamel excepted, it is all of pure Gold.

This, perhaps, was an Amulet of King *Alfred's*.

Exon, Dec. 10. 1698.

VI. *A Letter wherein is given an Account of the Catalogues of Manuſcripts lately Printed at* Oxford.

SIR,

ACcording to your Deſire, I will procure you one of the Catalogues of Manuſcripts, which is prized by the Delegates of our Preſs, at One Pound Two Shillings. By my readineſs in this little Affair, I would that you ſhould gueſs how much I am devoted to your Service; and as another Inſtance of an entire Obedience to all that you require, I have here ſent you my Judgment of the Work it ſelf, which (without any Complement) none but ——— ſhould have forced from me.

I know my own Inabilities too well, to be forward in medling with any thing out of my way and above my reach: yet when ——— tells me, with his uſual Sweetneſs, *That he would willingly be oblig'd to me for my Opinion of the Book, of the Value and Uſe whereof he deſires to be inform'd, in order to make a right Eſtimation of it.* I at length prevail'd with my ſelf, for a time, to put a ſtop to thoſe Studies I was engaged in, and which, I muſt needs ſay, were more agreeable to my Inclination; and have perus'd not only this, but ſeveral other Catalogues of Manuſcripts, my Thoughts upon all which, I preſent you with: Not that I am ſo vain as to ſuppoſe the Character of this preſent Catalogue now before me, will riſe or ſink for any thing I can ſay; but that I might convince ——— that all his Deſires, with me, have the Place of Commands.

But

But in order to make such a Judgment, it will not be amiss to turn over this Catalogue a little, enquiring whether the Books themselves are of such Value as to countervail so much Trouble and Charge; and in the next place, whether the Descriptions we here find, do represent them fairly and give us a fitting Notion of them or not.

The Catalogue consists (as you will find) of Two Tomes: The First of which takes in the Manuscripts in the *Bodleian*, *Savilian* and *Ashmolean* Libraries, which belong to the University in general, in Part I. and the Manuscripts in most of our College-Libraries in Part II. with those of the Libraries of the University of *Cambridge* in Part III. The Second Tome gives in Part I. Catalogues of the Manuscripts in the Libraries of many of the Cathedral Churches, and of several of the Nobility and Gentry: and in Part II. are some Catalogues of the Manuscripts in some Libraries of *Ireland*: each of which several Parts has its peculiar Index. I don't here insist upon Dr. *Smith*'s Catalogue of the *Cotton* Library, which though it be printed in the same Paper with this, and may be bound up together with it; yet it was publish'd some time since, continues to be sold distinctly by it self, and, as I conceive, was not intended by your Letter.

At the beginning of the Book is prefix'd an Epistle concerning the Nature and Use of it (to which I might well refer you, without giving you, or my self any further Trouble) which is followed by a Preface which endeavours to excuse some Faults which nice People find in some of the Catalogues; and acquaints us with the Method which was taken in composing the Indexes, with a List of all the Catalogues comprehended in the whole. Then comes the Life of Sir *Thomas Bodley*, the Magni-

ficent Founder of our Publick Library, with the Hiſtory of it, and an Account of its chief Benefactors, the Heads of whom are engraven on Copper Plates, here, and at the Front of the Book to be ſeen.

The firſt Catalogue is that of thoſe Greek Manuſcripts which once belong'd to *Signior Franceſco Baroccio* a *Venetian* Gentleman, which were highly valued in *Italy*, and by a ſingular Providence brought over into *England*, and by the Perſuaſions of *Archbiſhop Laud*, were bought by the old Earl of *Pembroke*, and preſented to our Univerſity. Theſe Books have been oftentimes celebrated by many Authors of Note, unto whom they have been highly Serviceable: And what Reputation they were in at the beginning, you may read in *Archbiſhop Uſher's* Letters, pag. 400. where you have that moſt learned Primate's Opinion of them, and pag. 406. where, ſays Sir *Henry Bourgchier* (who was afterwards Earl of *Bath*) *Dr.* Lindſell, *now Dean of* Lichfield, *tells me, that it* (the Parcel of *Barocian* Manuſcripts) *is a great Treaſure, far exceeding the Catalogue; that there are a great number of excellent Tracts of the Greek Fathers, never yet publiſhed; beſides divers ancient Hiſtorians and Geographers; and particularly that there is as much of* Chryſoſtom, *as will make a Volume equal to any of theſe publiſh'd by Sir* Henry Savil, And indeed, they have been conſtantly eſteemed as the moſt noble Parcel of *Greek* Books, that were ever yet repos'd in any *Engliſh* Library.

The Manuſcripts of Sir *Thomas Roe*, which he brought over with him from the Eaſt; and thoſe given by *Oliver Cromwell* have as good a Character, conſidering their Numbers: Thoſe of *Cromwell's* being accounted as the remaining part of the *Baroccian* Library; for ſome think that the Earl did not give the whole, but that he thought fit to detain thoſe which were afterwards given by *Cromwell*.

After

After theſe, comes a Catalogue of the Manuſcripts of Archbiſhop *Laud*, in Number One Thouſand Three Hundred, which he gave the Univerſity at Three or Four Donations, beſides what he gave to St. *John's College* in *Oxon*, and what he further intended us, had he not been prevented by the Iniquity of thoſe times. The Manuſcripts (as Dr. *Langbain* us'd to ſay) are ſufficient to make a large Library of themſelves, and are written in theſe Languages, *viz. Hebrew*, *Syriac*, *Chaldee*, *Æthiopic*, *Armenian*, *Arabic* (as well *African* as *Aſiatic*) *Perſian*, *Turkiſh*, *Chineſe*, *Japoneſe*, *Malayan*, *Malabaric*, *Ruſſian*, *Greek* (as well in the *Vulgar Greek* as the *Scholaſtic*) *Latin*, *Italian*, *German*, *Bohemian*, *Iriſh*, *Anglo-Saxon*, *Engliſh*, and one Book there is of the *Hieroglyphicks of Mexico*, as there are ſeveral others in other parts of the Library. What immenſe Charges muſt we think this Prelate was put to, to ſend Meſſengers on purpoſe, to almoſt all parts of the World, and there to buy up ſo many of their choiceſt Monuments? What noble Copies do we find here of the ſacred Books, Fathers, Hiſtorians, Poets, Orators, Philoſophers, Phyſitians, Mathematitians, and what not? This great Variety of Languages made me ask the Library-Keepers what other Languages they had Manuſcripts of in the Library, which were not enumerated among thoſe given by Archbiſhop *Laud*? They replied that there were Thouſands of Manuſcripts which were in the ſame Languages with that Prelates Books; beſides which, they ſhewed me Books written in the *Samaritan*, *Mendæan*, *Coptic* or *Ægyptian*, *Siameſe*, *Peguan*, *Indoſtan*, *Sanſcreet*, *Tylingan*, *Ceylonian*, *Tartarian*, *Spaniſh*, *Portugueſe*, *Britiſh*, *Francic*, *Friſian*, *Gothic*, and *Iſlandic*; they added farther, that beſides theſe, they knew not but ſome might be forgotten.

After

After these, follow the Manuscripts of Sir *Kenelm Digby*, which are chiefly *Mathematical*, though there be many other valuable Books among them on other Subjects. They are almost all of them uniformly bound up, with his *Coat* stamp'd on the Covers, as the better part of Archbishop *Laud*'s are likewise.

Then comes a great Number of other Manuscripts, given by very many particular Persons, and now inscrib'd to Sir *Thomas Bodley*, the promising Titles of which, you may very agreeably entertain your self with, till you come to

The Manuscripts of Mr. *John Selden*, that is his Manuscripts in the Greek and Oriental Languages, with some others of his Ancient Books: For I have been told, that the University never received his *Law Manuscripts*, nor his *Leiger* and other Books concerning the *English* Monasteries.

Next to these, come in order the Books which are said to be in *Hyperoo Bodleiano*; the chief Parcels whereof are these: 1. Those given by Dr. *Huntington*. 2. Those bought by the University of Mr. *Greaves*. 3. The Collections of Dr. *Richard James*, bought by the University after his Death, which are more particularly accounted for afterwards. 4. Those given by the Lord *Fairfax*, amongst which are the Collections of Mr. *Dodsworth*, of which more anon. And 5. Those bought by the University out of the Library of the Lord *Hatton*, amongst all which, are many Books of very great Value.

As for Mr. *Dodsworth*'s Collections, they make One Hundred and Sixty Volumes, written with his own Hand, and they contain a vast Treasure of Antiquities of all sorts, relating to our *English* History, and are continually used by the Lovers of it. These Books are the most prodigious Specimen of a single Person's unwearied Industry, that

that I ever yet saw; and it almost amazes and shames me, when I reflect upon so many Books written by the Hand of one Man, most of them in *Folio*, and the rest in *Quarto*: And at the same time, I can't but have a Veneration for his Memory, since all this Pains was taken in the midst of Discouragements; and for that he continued to his Life's end in amassing and heaping up together such Memoirs and Notices of things, as otherwise we should have been, for the most part, utterly ignorant of. Next to these, in the Catalogue, follows a more exact Account of

The Collections of Mr. *John Leland*, written all with his own Hand, who was as indefatigable as Mr. *Dodsworth*, and so continued whilst he was himself. His Design in these Collections, and others which are lost, or existent in other Places, was to set our *England* in its true Light, as may more largely appear by his *New-Years-Gift* to King *Henry* VIII. which I remember to have formerly read in Mr. *Weaver's Funeral Monuments*. But though neither Mr. *Leland* nor Mr. *Dodsworth* lived to digest their Collections, yet they have been and still are earnestly enquired after, and diligently perus'd by those that cultivate the History of *England*; though some have been so disingenuous as to conceal the Names of these Men, to whom they have been indebted for many a fair Remark.

The next Parcel of Books are those of an equally industrious Foreigner, the late learned Mr. *Francis Junius*, the chief Promoter of the *Saxon* Learning whilst he lived, as the Reverend Dr. *Hickes* is now. These Books Mr. *Junius* bequeathed to the University at his Death, all of them appertaining to the *Septentrional* Languages. Some of these are the old Manuscripts themselves, others are Copies of the most considerable *Saxon* Manuscripts in the *Cotton* Library, &c. accurately transcrib'd by himself;

or else his own Works, almost ready for the Press; or lastly, some curious printed Books, with his written Notes and Amendments.

Then follow the Papers of *Isaac Casaubon*, the *Adversaria* of Dr. *Langbain*, late Provost of *Queens-College*, *Oxon*, both in their own Hands. And afterwards a Catalogue of part of the Manuscripts bequeathed to the University by Dr. *Mareschal*, late Rector of *Lincoln-College*, the remaining part of them being described pag. 373.

Now comes the Titles of the Oriental Manuscripts of the learned Dr. *Pocock*, late Regius Professor of *Hebrew* in this University, which the University bought of his Widow. And a Catalogue of the Manuscripts of Dr. *Huntington*, which the University bought of him since his Return from the East. As also those Books which the University bought of Dr. *Hyde*: Which Three Parcels containing in them many Books of an extraordinary Price and Value, join'd to what was in the Library before, and has come in since, furnish any Scholar with sufficient Helps to pursue his own Studies in most of their Languages. For my own part, Sir, I confess, I am not skill'd this Way; nor will my necessary Affairs permit me to lay out such a Portion of my Time amidst these Books, as I might do, were my Circumstances otherwise than they are. But those who live more easily, and have Leisure, if they so pleas'd, might soon find Authors suitable to their own Genius, which they might Study with great Advantage. For if the *Old Testament* be fit to be read in the Original, and in those Tongues that approach nearest to the Original, and those Sages who from time to time have taken pains to illustrate it: If *Euclid*, *Aristotle*, *Hero*, *Apollonius Pergæus*, and others of the Ancients, part of whose Writings still remain to us translated into *Arabic*, though the Original *Greek* be lost; if these, I say, shall be accounted worthy to be read and publish-

publiſhed: If the Works of St. *Ephraim Syrus*, and many other Fathers and Eccleſiaſtical Writers, who are ſtill locked up in the Eaſtern Languages, ſhall be thought uſeful to Divines: In a Word, if the *Philoſophy*, *Poetry*, *Pharmacy*, *Laws*, *Religion*, *Hiſtory*, *Policy*, *Mathematicks*, *Mechanicks*, or any other part of uſeful Learning, which has flouriſh'd ſo long in the *Eaſt*, may be thought worth enquiring into; then, I think, theſe Books ought to be conſulted. Nor is the Way to them ſo difficult as ſome may imagine, ſince there is ſo great Plenty among them of excellent *Grammarians* and *Lexicographers*, and divers Books already to be had, which are printed with a *Latin* Verſion, and moſt of the Manuſcripts are written better than they can be printed, and ſome with the utmoſt exactneſs, and with Pictures in glorious Colours, which illuſtrate and adorn their Books, as Prints do ours. I beg your Pardon, Sir, for this Digreſſion, which I could not well forbear, in regard the *Oriental* Learning is not much cried up here, and becauſe it has been my good Fortune to ſee many of theſe Books in Libraries, which ſeem to promiſe ſo much, and (I had almoſt ſaid) are regarded ſo little.

After theſe, we have an Account of the Manuſcripts which Dr. *Barlow*, the late Lord Biſhop of *Lincoln*, bequeathed by Will to the Library; which is followed by the Particulars of the Manuſcripts left by Sir *William Dugdale* to the *Aſhmolean Muſæum*, moſtly written with his own Hand.

Theſe are followed with a Catalogue of the Manuſcripts given by Sir *Henry Savil*; an Account of ſome Mathematical Inſtruments belonging to the *Geometry* School, and a Catalogue of the printed Books there, being all Mathematical, which Catalogue was never before made Publick.

Then comes a Catalogue of the Manuſcripts, in the *Aſhmolean* Library, which are ranged under the following Heads, as, *Grammatici*, *Rhetorici*, *Muſici*, *Geometræ*, *Aſtrologici*, *Poemata*, *de Re Antiquaria*, *de Re Heraldica*, *Hiſtorici*, *Vitæ*, *Hiſtoriæ Naturalis*, *Chimici*, *Medici*, *Anatomici*, *Chirurgici*, *Juridici*, *Politici*, *Orationes*, *Geographici*, *Theologici*, *Magici*, *Prophetici*, *Fatidici*, *Miſcellanei*,, *Mechanici*, *& Epiſtolæ* ; with an *Appendix*, and an Account of the Manuſcripts left to the Univerſity by the late famous Antiquary, Mr, *Anthony à Wood* ; which are alſo laid up in the ſame *Aſhmolean Muſæum*.

Laſtly, comes the Titles of thoſe Manuſcripts which the Univerſity bought of the ſame Mr. *à Wood* ; and of thoſe left to the Publick Library by Dr. *Fell* the late Lord Biſhop of *Oxford*, and ſome others. Theſe Manuſcripts being between Eight and Nine Thouſand in Number, make up the Firſt Part of the Firſt Tome, which is ſhut up with every Author's Name, or Tract, *&c.* in the foregoing Catalogues. The Library-Keepers have told me, that ſince this Catalogue was printed off, the Univerſity has bought all the Papers, Manuſcripts, and Books collated with Manuſcripts, *&c.* which were in the Library of the late learned Dr. *Edward Bernard*, and that ſome other Manuſcripts have come in alſo, by the Generoſity of late Benefactors.

Sir, In this Account of the Catalogue, I have purpoſely wav'd the deſcribing of any particular Book ; Becauſe if I ſhould enlarge upon ſome which might p'eaſe me, and I might think curious ; yet I ſhould certainly run over many, as conſiderable in other Reſpects, which would be an Injury to them : And if I ſhould take in all the eminent ones, this Letter would ſwell into a Volume, and would be rather a Catalogue than an Epiſtle. I am afraid, Sir, I have impos'd upon your Patience already, but to make ſome amends, I will be more brief as to the remaining parts.

The

The Second part of the First Tome, as I told you before, consists of the Manuscripts in most of the Libraries of the *Oxford* Colleges, in this Order:

1 *University*-College, in which are Manuscripts	165
2 *Baliol*-College	319
3 *Merton*-College	348
4 *Exeter*-College	52
5 *Oriel*-College	72
6 *Queens*-College	40
7 *New*-College	323
8 *Lincoln*-College	113
9 *All Souls*-College	50
10 *Brasen-Nose*-College	16
11 *Corpus Christi*-College	271
12 St. *John's*-College	199
13 *Trinity* College	82
14 *Jesus* College	105
15 *Magdalen*-College	239
Omitted in *Merton*-College	1
Omitted in *Corpus Christi* College	7
Given to *Queens*-College by Bishop *Barlow*	106
16 *Magdalen*-Hall	12
17 *Wadham* College	14
Omitted in *University*-College	14
Omitted in *All Souls*-College	16
	2564
Given lately to *Lincoln*-College, by Sir *G. Wheeler*	76
In all	2640

And these, Except the *Appendix*, have their own Index, like the First Part.

In the Third Part of the First Tome, we have as good an Account of the *Cambridge* Manuscripts, as could be gotten; that is, of the Manuscripts in

1	*Emanuel* College, in Number	137	taken by Mr. *Barnes.*
2	*Trinity*-College	563	Mr. *Laughton.*
3	*Sidney Sussex* College	76	Mr. *Craven.*
4	*Gonvile and Caius* College	580	
5	*Bennets* or *Corpus Christi*-College	395	Dr. *James*, A.D. 1600.
6	*Peter-house*-College	268	Dr. *James.*
7	*Pembroke*-Hall	231	Dr. *James.*
8	*Jesus*-College	7	Dr. *James.*
9	*King's*-College	7	Dr. *James.*
10	*Trinity*-Hall	7	Dr. *James.*
11	The *Publick Library*	322	
		2293	

Which Catalogues, with their Index, make up the Third and last part of the first Tome.

The Second Tome, as I have said, comprehends the Libraries of Many of our *Cathedral Churches*, *Noblemen*, *Gentlemen*, &c. the chiefest of which I will reckon up, as they lye in the Catalogue.

The *Cathedral Churches* are those of *York*, *Durham*, *Carlisle*, *Worcester*, *Salisbury*, *Winchester*, *Lichfield*, *Hereford*, *Exeter*, *Wells* and *Canterbury*.

Other Libraries belonging to *Publick Places*, here described, are those of *Westminster*-Church, *Winchester*-College, *Coventre*-School, *Bristol*, *Grays-Inn*, *Eaton*-College

lege, *Greſham*-College, *Shrewsbury*, *Lincolns-Inn*, *Sion*-College, *Mancheſter*-Library, with Directions to the Manuſcripts in the *Heralds Office*, and to the Records in the *Tower*.

The Manuſcripts of the *Nobility*, are thoſe of the *Earl of Carlile*, the *Earl of Denbigh*, the *Lord Viſcount Longuevile*, the *Earl of Peterborough*, the *Earl of Derby*, the *Lord Biſhop of Norwich*, and the *Earl of Kent*.

The largeſt Catalogues of the *Gentry*, are thoſe of *Sir William Glynne*, *Dr. Plott*, *Sir Thomas Wagſtaffe*, *Mr. Leneve*, *Dr. Francis Bernard*, *Mr. Evelyn*, *Mr. Seller*, *Sir John Hoby*, *Dr. Johnſton*, *Mr. Bromley*, *Mr. Onſley*, *Mr. Chetwynd*, *Dr. Tyſon*, *Dr. Browne*, *Sir Henry St. George*, *Dr. Gale*, *Mr. Theyer*, *Mr. Pepys*, *Mr. Worſley*, *Sir Edward Norwich*, *Sir Henry Langley*, *Mr. Jones*, *Dr. Todd*, *Dr. Edward Bernard*, which laſt are now all in the *Bodleian* Library, *Mr. Thoresby*, *Mr. Burſcough*, *Mr. Brotherton*, *Dr. Sloane*, *Mr. Couſin*, *Sir George Wheeler*, which he has ſince generouſly given to *Lincoln*-College, *Mr. Farmer* and *Sir Symonds D'Ewes*. All which have appear'd Patrons to, and Encouragers of this Work, beſides whom, and others of leſs Note, here is exhibited a Catalogue of the Manuſcripts in his Majeſty's Library at *St. James's*, which I ought to have mentioned in the firſt Place; and one Foreign Catalogue which is that of *Iſaac Voſſius*, whoſe Manuſcripts are now at *Leyden* in *Holland*. The Books being good ones, and the Catalogue being hitherto, often enquir'd for, I am well ſatisfied to ſee it here, tho' the Books were ſuffered to go out of the Kingdom. This part likewiſe has its Index.

The laſt part of the Book, that is, the Second Part of the Second Tome, gives us the Catalogues of *Ireland*, *viz.* of the Earl of *Clarendon*, who, though he be an *Engliſh* Peer, yet the Books are *Iriſh*, and were brought from *Ireland*. The next is that of the College of *Dublin*, then

then that of the Lord Archbiſhop of *Dublin*, with the Titles of thoſe Oriental Manuſcripts, which he lately bought out of the Library of *Jacobus Golius*, and laſtly of Dr. *Madden*; which laſt Part, as all the reſt, has its particular Index; and by this means, each part may be bound up by its ſelf, and interleav'd.

I can't believe that any body will now deny, that the Books themſelves (whereof theſe Catalogues give you the Titles) are extant in thoſe Publick or Private Libraries to which you are referred: At leaſt, when any Book here ſaid to be in any Library in this Univerſity is deſired, recourſe is had to it immediately, and I doubt not but that the ſame fairneſs has gone through the whole. If this be granted that we have ſuch Books in the Kingdom, as we pretend to have; I make no queſtion but their Value will be eaſily allowed, ſince there is nothing required in a Book to enhance its Price, but what runs plentifully through this Collection.

Books (I mean Manuſcripts) are uſually valued and had in Eſtimation, either in regard of *their great Age*, *the Language they are written in*, *their Beauty*, *or for their Rarity*: Upon all which Accounts, I look upon our *Engliſh* Libraries, and conſequently upon theſe Catalogues to be very conſiderable.

If *Antiquity* at any time prefers one Manuſcript or one Copy of the ſame Author before another; there are ſeveral mentioned here, of as great Age, as thoſe we meet with in Libraries abroad: And indeed I muſt always prefer the moſt *ancient and accurate* Copies of all *ancient* Authors, whether they be *Sacred* or *Prophane*; and without the help of ſuch, we ſhould never have had a correct Text of many of them: and by their Aſſiſtance, many obſcure Places are every Day, and will ſtill be amended.

Nor

Nor is the *Language* wherein Manuſcripts are written, leſs to be look'd upon; I mean the *Original* in reſpect of *Tranſlations*. 'Tis well known, that the *Greek Phyſitians*, *Mathematitians*, *Philoſophers*, &c. which made up the greateſt part of the Learning of the *middle* and the *following Ages*, were not ſtudied in the Original, but only in a corrupt *Latin* Verſion of the *Arabic* uſed by the *Moors* in *Spain*, which *Arabick*, was tranſlated from the *Greek* by the *Saracens*. So that receiving their Learning at the third Hand, 'tis no wonder they could not comprehend the true Sence and Meaning of their Authors. And how many Authors of great Note there are, as yet in print only in a vicious Tranſlation, whoſe own Words, in their own Language, are ſtill extant in our Libraries; may be ſeen by peruſing theſe Catalogues.

Some People have got a Notion that all Manuſcripts are only a Company of old, ruſty, Moth eaten Books, upon which a Man may pore his Eyes out before he can read a Word or a Line, *&c.* which I take to be a meer Cavil. 'Tis true, every body has not the Gift of writing an excellent, or even a tolerable good Hand; nor are ſome of the Manuſcripts written about Three Hundred Years ago, very eaſie to be read by one who is not us'd to them. But that this muſt affect all Manuſcripts I ſee no Reaſon, ſince many which I have ſeen far exceed our modern writing; nay, I have heard ſeveral of the beſt Pen-men in *London*, ingenuouſly confeſs that they could not write a Book near ſo well as ſome they have ſhewed me; which yet, are by far exceeded by many that I have been ſhewed in the *Bodleian* Library. I could eaſily name to you ſeveral Books there, in *Engliſh*, *Latin*, *French*, *Greek*, *Hebrew*, *Arabick*, *Perſian*, *Syriack*, &c. which are written almoſt to a Miracle, beyond any thing Printed, and beyond the Idea which any body can have of them, who has not yet ſeen ſuch things.

Nor

Nor can I leſs admire the Magnificence of our Anceſtors in other Matters relating to Books, beſides the fair Writing of them. How many had they written from the beginning to the end in Letters of Silver, or letters of Gold, or both, cover'd over with Plates of Maſſy Silver, or Gold and Enammel, which are now either loſt, or ſacrilegiouſly torn from them? Notwithſtanding which Barbarity, ſome remain to us ſtill. Where do we ſee Books ſo richly painted and adorned now, as our Forefathers caus'd theirs to be done? The *Bodleian* Library-Keepers ſhewed me many ancient Books of this ſort, finely deſigned and painted, by one of which it appear'd, that half the Book took up near Six Years time to illuminate it; which however, was inferior to another they ſhewed me, whoſe Workmanſhip upon a very moderate Computation, could coſt little leſs than a Thouſand Pounds Sterling. And this I take to be an Argument likewiſe, of their Love to Learning, ſince 'tis likely, that otherwiſe they would not have laid out ſuch Sums of Money upon it: And who can tell, but that the Splendor and Magnificence of ſome of their Books, has alone preſerv'd them from Deſtruction?

Laſtly, the *Rarity* of Manuſcripts, which make ſome more ſought after than others; is when ſuch a Book is the αὐτόγραφον, or the beſt, or the only Copy of ſuch an Author, &c. or is written upon a curious or a deſirable Subject. Of which ſorts, many often occur in theſe Catalogues. That I may omit the vaſt Numbers of more recent Books, treating of our late Kings and Queens, their Policies and Intrigues, their Treaties and Negotiations, their Power and Force by Sea and Land; and the like of moſt other Countries. With the Genealogies and Hiſtories of the Lives and Deaths of our moſt eminent Stateſmen, Scholars, Soldiers, Lawyers, &c. the Heads

of

of which are too many to be here reckon'd up; but are largely accounted for in the Catalogue.

One thing, indeed, is objected againſt this Work by ſome ſqueamiſh Perſons, ſome of whom are Foreigners (who look upon our Store of Manuſcripts with an ill Eye) and others are of our Country-men, who ſay, *That there be many Faults in this Book, and that divers of the Catalogues are erroneous in ſome, and not large and particular enough in other places.* Which very Objections, however, ſuppoſe that ſome Catalogues, if not the greateſt part, are done well enough to give even themſelves Satisfaction; As for the Foreigners, before they find Fault with this, it would be fit they ſhould put out better Catalogues of their own Manuſcripts: This Work, as faulty as it is, exceeding their Performances in this kind, as much in Accuracy, as in the Number of Books it repreſents. And if our Country-men will but take the Pains to conſider it throughout, they will find (nor can Envy it ſelf deny it) that many of theſe Catalogues are moſt judiciouſly and exactly taken; and all the reſt ſo well done, as to deſerve rather their Thanks than their Cenſure. If ſome of the Manuſcripts contain here and there a Tract which is not mentioned; 'tis better ſo, than to put down the Titles of thoſe Tracts, which are not now to be found in the Book: For this would be an Affront and Abuſe upon the World; when as that may be remedied in another Edition. And the very Catalogues which they quarrel with, give us the Author's Name, and the Title of the Book if it be Anonymous, and for want of that, ſufficient Notice of the Subject-Matter of it; which, one would think, might give Content to any Perſon of a candid and ingenuous Diſpoſition: Eſpecially conſidering the newneſs of the Deſign, the great Difficulty of procuring ſo many Catalogues as they are here preſented with, and that Promiſe which is

made to the Publick, that all the Amendments that are made, ſhall be entred into an interleav'd Catalogue in the *Bodleian* Library, from whence they may correct their own. But by the way, it may not be much amiſs to obſerve, that theſe very Men who rais'd the Objections againſt it, have been known to be eager in making uſe of it, when they wanted notice of Manuſcripts, according to their ſeveral Occaſions.

And as they have already found the Benefit of it in their way of Study, ſo ſeveral eminent Scholars have done, even before it was publiſhed: Whereof I will mention but Two, *viz.* the Reverend Dr. *Cave*, as may be ſeen in his Second part of his *Hiſtoria Literaria*, and Mr. *Grabe*, from whom we expect many (hitherto unprinted) Pieces of the *Primitive Fathers* to be quickly publiſhed from the Manuſcripts, to which he was directed by theſe Catalogues alone. And this is one great thing, wherein theſe Catalogues may be ſerviceable to all Men of Letters, by admitting them to the latent Riches of the Nation, whereby they may be much better enabled to give us good Editions of Books than formerly. If any Author be to be re-printed, the Catalogues will be forthwith conſulted, in order to know what Manuſcript Copies there be of him amongſt us, and where they are; that ſo they may be collated, and the moſt important *Readings* and other Remarks be, from them, made Publick. If any other Subject be to be treated of, next after ſeeing what there is in Print upon it already, recourſe is had to the Catalogue, to ſee what there remains unprinted; the publiſhing of which is beſtowing ſo much Learning upon the World which they had not before. Beſides, by diligently reading over theſe Catalogues, we acquire a compleat Notion of the Writers of almoſt all Ages and Nations, and of their Works: the Catalogues of *Printed* Books giving only an Account of

thoſe

thoſe Books already in *Print*, not mentioning thoſe Manuſcripts, which have been (as I may ſo ſay) hid and concealed from the World all this while, eſpecially thoſe in private Libraries.

Another Account upon which this Catalogue may be ſerviceable is, (for the Honour and Credit of *England* in general, and of our *Univerſity* in particular) to un-deceive many Learned Perſons beyond the Seas; ſome of whom have been too much prejudiced againſt us for our ſuppoſed Penury in this Kind, and others who had heard ſome uncertain Rumours of our Plenty of Manuſcripts, have perhaps believed it to be true, but could never get any tolerable Liſt of them. Dr. *James* was the firſt who publiſhed any Catalogue of our Manuſcripts, which now makes but a ſmall part of this Book, and yet the Foreigners, almoſt ever ſince, have went by that Catalogue: And all the great Acceſſions to our Publick Libraries have not been much taken notice of. *Iſaac Caſaubon* came hither to *Oxford* about the Year 1613. as appears by one of his *Epiſtles*, where talking about the *Bodleian* Library, *Noli* (ſaith he) *cogitare ſimilem hic reperiri librorum manuſcriptorum copiam atque eſt in Regia. Sunt ſane & in Anglia manuſcripti non pauci, ſed nihil ad Regias opes.* But was that great Man now alive, he would, doubtleſs retract this Saying; ſince in this Particular, the *Bodleian* is certainly ſuperior to the *French King's* Library, as it was in the Year 1640. if we may truſt a Catalogue of it, which was made at that time, or *Labbæus* ſince, who ſeems to magnify it enough. And if any of the Foreign Catalogues contain the Titles of all the Manuſcripts in their reſpective Libraries, this of ours is ſuperior to them all: but if their Catalogues be taken by halves, 'tis their own fault.

The ſame Opinion of our *Publick Library*, many other Strangers have had beſides *Caſaubon*. And *Spizelius* in

his Collection of Catalogues of Manuſcripts of the greateſt Libraries in *Europe*, which he printed but Thirty Years ago; when he comes to the *Oxford* Library, and tells you that he had learnt from *Hottinger* that we had received the great Additions of the *Baroccian* and *Archbiſhop Laud*'s Manuſcripts, goes on thus, *ſed quorum deſignationem à me nondum viſam, invito præterire debui ſilentio.* And *Hottinger* himſelf complains that he could not get the Catalogues of them, and was therefore forced to make mention of them only by *Hear-ſay*, The good-natur'd Gentleman took a deal of Pains in deſcribing many other Books of *Mr. Selden*, *Mr. Greaves*, &c. as he could get notice of them, which are now for the moſt part, in our ſaid Library. I could mention divers other Foreign Writers to you, but I ſuppoſe, I have tired you ſufficiently already: I'm ſure I am weary, and will therefore conclude this long Epiſtle with a Teſtimony of the ſame *Hottinger*, who being an Out-landiſh Man, may be eſteem'd more unprejudiced in our behalf. It is in his *Bibliothecarius quadripartitus*, pag. 33. where, after he had (as well as he could) deſcribed ſome of our *Publick* and *Private* Libraries, that he cloſes his Diſcourſe in this manner, *Quoniam vero tot Anglia Bibliothecis triumphat, tot Manuſcriptis reliquas ſuperat, tot Orientalium Monumentis abundat, adeoq; ſubſidiis rei litterariæ inſtructiſſima eſt; quid miremur, ex hac etiam Inſula, tot eruditionis Philologicæ, & Theologiæ Practicæ cumprimis hactenus prodiiſſe monumenta?* Which, in my poor Opinion, may, upon the coming forth of theſe Catalogues, be more fitly applied to the Nation, than ever before. I am,

SIR,

Your, &c.

VII. An

VII. *A further Account of the Contents of the* China *Cabinet mentioned laſt Tranſaction, p.* 390. *By* Hans Sloane, *M. D.*

Fig. 5. repreſents what is commonly, but falſely, in *India*, called, *The Tartarian Lamb*. This was more than a Foot long, as big as ones Wriſt, having ſeveral Protuberances, and towards the end ſome Foot-ſtalks about Three or Four Inches long, exactly like the Foot-ſtalks of Ferns, both without and within. Moſt part of the outſide of this was cover'd with a Down of a dark yellowiſh Snuff-Colour, ſhining like Silk, ſome of it a quarter of an Inch long. This Down is what is commonly uſed for ſpitting Blood, about Six Grains of it being to a Doſe, and Three Doſes pretended to cure ſuch an Hæmorrhage. In *Jamaica* are many ſcandent and Tree-Ferns, which grow on, or to the bigneſs of Trees, and have ſuch a kind of *Lanugo* on them, and ſome of our *Capillaries* have ſomething like it. It ſeem'd to be ſhap'd by Art to imitate a Lamb, the Roots or climbing part is made to reſemble the Body, and the extant Footſtalks the Legs. This Down is taken Notice of by Dr. *Merret* at the latter end (p. 386.) of Dr. *Grew*'s *Muſ. Soc. Reg.* by the Name of *Poco Sempie*, a Golden Moſs, and is there ſaid to be a Cordial. I have been aſſured by Dr. *Brown*, who has made very good Obſervations in the *Eaſt-Indies*, that he has been told there by thoſe who have lived in *China*, that this Down or Hair is uſed by them for the Stopping of Blood in freſh Wounds, as Cobwebs are with us, and that they have it in ſo great Eſteem that few Houſes are without it. I have known it much uſed for ſpitting of Blood; it being pretended, that ſome of the ſmall Down may, by being ſwallowed, eaſily ſlip into the Wind-

pipe

pipe, and ſo ſtop the Bleeding: But on Tryals I have ſeen of it, though I may believe it innocent, yet I am ſure 'tis not infallible.

Fig. 6, 7, 8, 9, 10, 11, 12, 13. Shew Eight ſeveral Inſtruments made for paring the Nails, at which, in *China*, the People are very curious and dextrous. Theſe Inſtruments are each of them ſhaped like a Chizzel.

Fig. 14. repreſents a kind of Inſtrument, called, in *China*, a Champing Inſtrument. Its uſe is to be rub'd or roul'd all over the Muſcular Fleſh. It is like an Horſes Curricomb, and is ſaid to be uſed after the ſame manner, and for the ſame Purpoſes that they are made uſe of for Horſes.

VIII. An Account of a Book.

Muſeo de Piante rare della Sicilia, Malta, Corſica, Italia, Piemonte e Germania, &c. di Don Paolo Boccone, &c. *with additional Remarks by Mr.* John Ray, *F. R. S.*

THE learned and ingenious Author of this Work, Signior *Paolo Boccone*, a Gentleman of *Sicily*, Botaniſt to the Great Duke of *Tuſcany*, and now a Monk of the *Ciſtertian* Order, of the Province of *Sicily*, having changed his *Prænomen* into *Sylvius*, hath rendred himſelf well known to the learned World, by his Writings publiſhed many Years ſince, *viz.* His *Icones & Deſcriptiones rariorum Plantarum Siciliæ, Melitæ, Galliæ & Italiæ*, Printed at *Oxford* in the Year 1674. And his Letters

ters about several Natural Curiosities, Written in *French* and Printed at *Amsterdam*.

In this present Work he gives us a large Collection of rare Plants, the greatest part whereof are new and *non-descript*, curiously delineated and engraven in a Hundred and Thirty Octavo-Plates, which he divides into Decads, inscribing each Decad to a *Venetian* Nobleman. Two Defects there are in this Work; the one want of Method, the other of Descriptions. 1. As for Method, there is none at all observed in it, the Species being promiscuously and indiscreetly placed as they came to Hand, without any Order or Connexion. 2. Besides the Names, the Stature and Magnitude, the Places where he found them, or Persons from whom he received them, he hath to a great Number of these Plants added no Descriptions of the principal parts, Root, Stalk, Leaf, Flower, Fruit. This, though he endeavours to excuse p. 171. by telling us, That he writes to such as are advanced in the Knowledge of Botanicks, who need no long Descriptions, and to whom they would be rather tedious than useful, and not to Novices: Yet can he not easily perswade us, but that concise exact Deseriptions would ease the greatest Proficients of a much Trouble in finding out and exactly determining the Species. He had also obliged us, if he had given us the Synonyms of such as he took to have been described by others before him, together with the Names of the Authors of such Synonims and Descriptions. This also he endeavours to excuse by want of time and Books. Yet all this notwithstanding, we ought rather thankfully to accept what he hath done, by enriching the History of Plants with such a multitude of new Species, than to censure or reprehend him for what we apprehend he hath omitted, which he might have done.

Besides

Besides the main Subject of this Work, the Author intermixes many curious Observations and Remarks Physiological and Medicinal: As for Instance, he tells us, That because we find not either among the Ancients or Moderns any Alcalick Medicine drawn only from a simple Vegetable, without any other Preparation but meer Trituration, therefore he will in this Observation (which is the second in number) communicate an Antacid Medicine of much Efficacy in curing the biting of a Mad Dog, of a Viper or other Serpent, of Fevers, Cholicks, Wounds, *&c.* called by the Palermitanes, *Sanatodos*; which is only a part of a Plant of no great Account among Herbarists, in brief, it is nothing else but the Sponge of the Dogs-Rose, called by some *Bedeguar*, dried, and grosly pulverized. For the biting of a Viper, after Scarification and Cupping, sprinkle upon the Wound the Powder of *Sanatodos*, and afterwards give to drink in generous Wine a good Quantity of the same Powder several times. For the biting of a mad Dog, give of the said Powder inwardly, and apply it outwardly to the Wound, first moisten'd in Strong Wine, or Oyl-Olive, in like manner use it for the stinging of a Scorpion. For continual Fevers it is to be often taken in Broth or other Meats. Several other Diseases he mentions, in which it's useful, especially the Colick, the Pains whereof, being given to drink in Red Wine to the Quantity of about a Drachm, it mitigates in half an Hour's time. One thing I cannot but wonder at, that Signior *Boccone* should take no Notice that the Root of this Rose had been of old celebrated by *Pliny* for the Cure of the *Hydrophobia*, as a Medicine revealed in a Dream, *Hist. Nat.* L. 25. c. 2. & lib. 8. c. 4. in these Words, *Insanabilis ad hosce annos fuit rabidi canis morsus, pavorem aquæ potusq; omnis afferens odium. Nuper cujusdam militantis in prætorio mater vidit in quiete, ut radicem*

cem Sylveſtris Roſæ, blanditam ſibi aſpectu pridie in fratecto, mitteret filio bibendam. In Luſitania res gerebatur, proxima Hiſpaniæ parte; caſuq; accidit, ut milite à morſu canis incipiente aquas expavaſcere ſuperveniret epiſtola orantis ut pareret Religioni, ſervatuſq; eſt ex inſperato, & poſtea quiſquis auxilium ſimile tentavit.

2. Another Obſervation he gives us concerning the Seed of *Sophia chirurgorum*, or *Flixweed*, which being taken in Broth or Wine entire without reducing to Powder ſtops vomiting of Blood, and cures the Dyſentery or Bloody-Flix, from whence the Plant hath its Name in *Engliſh*; which doth not ſucceed, if it be well pounded or beaten to Powder; the Reaſon whereof he aſſigns to be, becauſe the oyly-Subſtance which is more apt to diſſolve than to coagulate, is looſened by pounding, and ſeparated from the other parts.

3. A Third Obſervation we ſhall mention is, That in many Plants the Flower receives its Tincture or Colour from the Root. He inſtances in the greater *Celandine*, whoſe Roots and Flowers are of a Yellow or Saffron Colour; the Barbery or *Oxyacantha*, which alſo hath both Roots and Flowers of a Yellow: The *Dentellaria* of *Rondeletius*, whoſe Roots and Flowers agree in the ſame vinous or *Griſdeline* Colour. The *Acacia Indica Aldini*, &c. The Reaſon whereof he aſſigns; becauſe the more fixt parts wherein the Colour conſiſts, preſerve the ſame Tincture without being altered by a long Circulation they make to the Flower. Hence he obſerves, that thoſe Plants are more fit for dying Cloth, which are Lignoſe, and have their Root agreeable in Colour with the Flower.

4. He gives us out of *Cæſalpinus*, the Preparation of *Cate*, (which he takes to be the ſame with *Catechu*) which is the inſpiſſate Juice of the *Lycium Indicum*, or

Tree called *Cadira*, by the *Indians*, which they thus prepare, They divide the Heart [*Medulla*] of the Tree into thin Slices, which they grind upon a Marble, such as Painters use, and boyl the Powder in a sufficient Quantity of Water for Four and Twenty Hours, and then strain it. This Decoction they boyl again beyond the Consistency of Honey, but not so hard as Wax, of which they make *Pastilli*, which being dried are outwardly black, but inwardly reddish. This Opinion he rather adheres to, than that of a late learned Traveller in *India*, who asserts *Catechu* to be made up of the Juice of the Fruit of *Areca* or *Faufel*, and a certain Mineral Earth of that Place.

5. He presents us with a sort of *Pistachio*-Tree, which he calls, *Pistacium mas siculum folio nigricante*, which produces no esculent Fruit, being by it self barren, though in respect of the Female, which it impregnates with Fruit, it may be said to be fruitful. Then he gives us the Notes of Distinction between the Male and Female *Pistachio*, and tells us how the Country-men ingravidate the Female with the Flowers of the Male, *viz.* They wait till the Female hath its Flowers explicated; then they take, at their Discretion, many Flowers of the Male, which are in Bud and just ready to open, and put them into a Vessel, and having encompassed them with Earth moistened with Water; they hang this Vessel with the Flowers on a Branch of the Female *Pistachio*, and there leave it till the Flowers be dried, that so the Powder which they scatter may more easily by the help of the Wind be dispersed over all the Branches of the Tree, and ingravidate them with Fruit. Other more compendious Ways he mentions, which the Country-men use of scattering the Dust or Powder of the Flowers of the Male upon the Female. He tells us, That the Male, for the most part, flowers and scatters its Prolifick Powder before the Female puts forth its Blossoms (which happens in most Plants supposed to differ in Sex) and what Provision they make in that case. *This being the general Practice in* Sicily, *must needs depend upon Observation, that without so doing the Trees would not be fruitful, or at least not to that Degree, and confirms the Opinion, that there is in Plants also a difference of Sex.*

This

This whole Observation about the *Pistachios* he inserts also into his *Museo di Fisica & di esperienze variato*, &c.

6. He brings an Observation concerning a Woman of *Chambery* in *Savoy*, who being afflicted with a fierce Apoplexy, after various Medicines in vain used, grew lame on her whole Left Side from Head to Foot; whom an Emperick undertaking to cure, spent Eight Boccale of *Aqua Vitæ*, and Twelve Pound of Camphire upon her, in Six Weeks time, anointing every Morning and Evening the whole part affected without any Benefit at all. The Woman mean time was with Child, and without suffering any Inconvenience, at her due time brought forth a Son, otherwise perfect, save that all his Bones were so soft and tender, that he could not bear himself upon his Feet; the Bones of his Legs, as also his Arms and Hands being so tender, that they seemed flexible Tendons: And in this Case he lived Eighteen Months. This Effect he, and not without Reason, attributes to the Camphire.

I have often wondred how Out-landish Authors should so grosly mistake in the Orthography of English Words we find in their Writings. But by an Observation in this Book concerning the *Serpentaria Virginiana* (the Name and a tolerable Description whereof Signior *Boccone* had from one *Edward Painten*) I perceive how it might come to pass, *viz.* They received these Words from some illiterate English Men, and put them down according to the Pronunciation, spelling them as Words of such Sound and Pronunciation in their own Language are spell'd. So, doubtless, *Edward Painten* pronouncing the Word *Snake-root*, as the *Italians* do *Snecrut*, (we often pronouncing *a* as they do *e*, and they having no double *o*) Signior *Boccone* writes it *Snecrut*. But because he desires farther Satisfaction concerning this *Serpentaria Virgin.* or *Snake-root*, I shall give him, and others that concur with him in that Desire, a full and exact Description of the whole Plant, drawn up and sent me by a Person that knew it very well, and was as well able to describe it, the Learned and most Skilful Herbarist Mr. *John Banister*, whose unhappy and untimely Death cannot sufficiently be deplored.

The *Pistolochia*, or *Serpentaria Virginiana* hath a bushy Root, consisting of a Number of small Strings of a yellowish Colour, and hot Aromatick Scent and Taste: Thence grow One or

Two ſmooth, at leaſt very little hairy, Stalks, round and moſt commonly upright, not ſquare nor trayling: The leaves grow alternately on this ſide and that, one at a Joint or Knee: They are thin long and pointed, coming in like a Heart at the Footſtalk, a little Hairy above, and rough with many protuberant Veins underneath, and in handling they ſtick a little to the Fingers. Near the Ground grow One or Two hollow Flowers, each upon its proper Foot-ſtalk, different in Form from the *Piſtolochia Cretica*, or any other yet known; all whoſe Flowers (if Authors Figures, or the Plants themſelves dried, rightly inform me) reſemble a Cows Horn, the top growing to the Rudiment of the Seed-Veſſel, and the open end cut ſlaunting like a Drenching-Horn, whereas this of ours terminates with a Heel, which ſupports a broad, round, galerniculated Lip, the Center of which opens into the Hollow of the Flower. The Lip is of a light ruſſet or dirt Colour. The Seed Veſſel is hexagonal, ſhap'd like a Pear, when full grown near half an Inch in diameter. It is not an ever-green, but after the Seeds are ripe, the Leaves and Stalks begin to wither and decay. It flowers in *May*, and its Seeds are ripe in *Auguſt*.

AN

INDEX

TO THE

Philosophical Transactions.

From Number 236, to Number 247. inclusive.

A.

ALcanna, N. 243. p. 296.
Anatomy *of* Carigueya *or* Opossum, N. 239. p. 105.
Animals *from* Maryland, N. 246. p. 393.
Antiquities, Roman, N. 244. p. 310. *found in* Somersetshire, N. 247. p. 441.

B

BArometer, *heights of the Mercury in it at top and bottom of the Monument*, N. 236. p. 2. *Portable*, ib. p. 3. *To measure the height of Mercury in it*, N. 237. p. 45. N. 240. p. 176.
Bartholini Casp. *specimen*, &c. N. 237. p. 62.
Beetles *their Eyes*, N. 240. p. 169.
Bite *of a Serpent which prov'd mortal*, N. 245. p. 351.
Black Lead, N. 240. p. 183.
Blew Fire *to make*, N. 238. p. 89.
Blood, *Observations about it* N. 241. p. 224.
Books, *Catalogues of those lately printed*, N. 240. p. 200. N. 241. p. 244. N. 243. p. 307. N. 245. p. 386 N. 246. p 426.
——*Of some now about to be published*. N. 240. p. 202. N. 241 p. 244. N. 243. p. 307. N. 245. p. 388.
——*Accounts of them*, N. 236. p. 29. N. 237 p. 57 N. 238. p 98 N. 240. 196. N. 141. p. 240. N. 243. p. 304. N. 244 p 338. N. 245. p 385.

Breathing,

Breathing, N.240.p.177,181.
Butterflies *Egg as big as a Wrens*, N.240. p.167.

C

CAncer, traite du. N.240.p. 199.
Carigueya, *Anatomy of it* N. 239.p.105.
Caterpillars *destroying Fruit, Observations on them*, N 237.p.54
China *Instruments for the Ears*, &c.N.246.p.390, *For Nails*, &c. N.247.p 462.
Clam. N.240.p.168.
Copper *Farthings swallowed*, N.246.p.424.
Curvæ celerrimi descensus investigatio, N.246.p.425.

D

DEaf *and Dumb Persons how to instruct*, N.245.p.353.
Death-watch, *what it is*, N. 245.p 376.
Dog *had Mercury injected into the Jugulars*, N.240.p.184.

E

EAster, *a Letter about it*, N. 240.p.185.
Eclipsis Lunaris, 29 Oct.1697. N.236.p.15.
Eels, *about them*, N.238.p.90.
Electrical *Bodies, Catalogue of them*, N.245.p.384.
Embryon quatuor septimanarum, &c. N.238.p.66.
Equation, N.240.p.190.
Eruption. *Of Fire*, N.245p.378. *Of Water*, ib. p.382.
Experiments, *About the Barometer*, N.236.p.2. *About Preservation of Flowers, Fruits*, &c N.237.p 41. *About giving variety of Tinctures to Water*, N.231.p 87. *About Breathing*, N.240. p. 178, 181. *About Freezing*, N. 245. p. 384. N. 246. p.439. *About Sounds*, ib. p. 433.
Eyes *of Beetles*, N.240. p.169.

F.

FOetus *Bones voided by the* Os Pubis. N.243.p.292.
Fire-Flies. N.240. p.167.
Froggs. N.240.p.168.

G.

GAll-Bee. N. 145.p.375.
Generation *of Animals*. N.244.p.337.
Giant's Causway. N.241.p.209.
Globe-glass *in Marble colour to paint*. N.245.p.364.
Gold, *to gild on Silver*. N.243. p. 266.
Grashoppers. N.240.p.168.

H.

HEmlock-water dropwort, *its poysonous Qualities*. N. 238. p.84.
Hortus Amstelodamensis, *Account of it*. N.236.p.29.
Humbirds. N.240. p.168.
Hurricanes, *and their Prognosticks*. N.246. p.407.

I.

IMagination, *Effects of it*. N. 243.p.293.
East-India, *Account of it*. N.243. p.338.
Inundation *in the Island* Mauritius. N.242.p.268.

Ipecacuanha, *a Cure for Looſeneſſes.* N. 238. p. 69.
Iris. N. 240. p. 193.
Iron, *to give it the Tincture of Copper.* N. 243. p. 296.

L.

LAmp, *to keep it full.* N. 245. p. 380.
Magick Lanthorn *to make.* N. 245. p. 364.
Lichen cinereus terreſtris, *its Vertues.* N. 237. p. 52.
Lightning, *Effects of it.* N. 236. p. 5.
Looſeneſſes *cured by* Ipecacuanha. N. 238. p. 69.

M.

MAckenboy, *Vertues of it.* N. 243. p. 293.
Mad *Creatures, a Cure for their Bitings.* N. 237. p. 49. — *Dogs Bitings.* N. 243. p. 307.
Indian Manuſcripts. N. 246. p. 421. *Engliſh, an Account of them.* N. 247.
Marſigli del foſfero minerale. N. 243. p. 307.
Meaſures *of a large Man.* N. 240. p. 184.
Monſtrous *Calf with two Heads.* N. 238. p. 79.
Muſick, *a Queſtion in it anſwered.* N. 238. p. 80. — *Concerning its ſtrange Effects.* N. 243. p. 297.

N.

NUmiſmata, *a Diſcourſe of Medals,* &c. *Account of it.* N. 247. p. 57.

O.

OBſervations, de fœmina, quæ non obſtante vaginæ uteri coaleſcentiâ, infantem peperit. N. 237. p. 56. — de embryone 4. ſeptimanarum. N. 238. p. 66. — *Made in* New-England. N. 240. p. 167. — *from the* Eaſt-Indies. N. 243. p. 273. — *in* Nova Hollandia. N. 245. p. 361. — *in* China. N. 245. p. 371.
Opoſſum, *Anatomy of it.* N. 239. p. 105.
Organ, *imperfections of it.* N. 242. p. 249.

P.

PAlſy, *a periodical one.* N. 242. p. 257.
Papaver corniculatum luteum, *it effects.* N. 242. p. 263.
Pflugk de Bibliotheca Budenſi. N. 243. p. 305.
Pitch, *how made.* N. 243. p. 291.
Plants, Indian, *their Names,* &c. N. 244. p. 313. *from* Maryland. N. 246. p. 398.
Phoſphorus metallorum, *to make* N. 245. p. 365.
Pocoſempie. N. 247.
Poland, *Account of it.* p. 98.
Poſture-Maſter. N. 242. p. 262.
Poyſonous *qualities of Hemlock-water drop-wort.* N. 238. p. 84.

Q.

QUadratura Logarithmicæ. N. 248. p. 373.
Quinſie *cauſed by a Stone.* N. 247. p. 449.

R.

ROsin, *how made.* N. 243. p.291.
Ruſma.N.243.p.296.

S.

SAlts, *factitious,*N.243.p.281.
Serpent's *bite.*N.245.p.351.
Shield, *a* Roman *one.* N.241.p. 205.
Shower *of Fiſhes.* N.243.p 289.
Sinenſes obſervationes. N.237.
Slate, Iriſh. N.243.p.271.
Sounds, *Experiments about them.* N.247.p.433.
Stomach, *motion of it.* N. 243. p.278.
Stone *of the Bladder, extracting it from Females.* N.236. p.11.
— *voided by a Boy.* N. 242. p.264.
Storm *of Thunder and Lightning.* N.236. p.5.

T.

TAR, *how made.* N.243.p. 291.
Thorax, *Water Syring'd into it.* N.240.p.181.
Thunder, *Effects of it.* N.236. p.5.
Tinctures *to Water, to give.* N. 238.p.87.
Tortoiſes. N.240.p.168.
Tournefort, hiſtoire des Plantes *&c.* N.245.p.385.
Turpentine, *how made.* N.243. p.291.

V.

VOyages *and Diſcoveries in South* America. N. 240. p.196.

W.

MIneral Waters. N. 245. p. 365. *Of St.* Amand. N. 247.p.430.
Weather, *Regiſter of it for* 1697. N.237. p.47.
Welſchij baſis botanica. N.243. p. 304.

ERRATA. Numb. 246.

PAG. 424. line 3. read that the ſeveral Leaves of all theſe Books, *&c.*

London: Printed for *Sam. Smith,* and *Benj. Walford,* Printers to the Royal Society, at the Prince's Arms in St. *Paul's* Church-Yard. 1698.

BRITISH MUSEUM NATURAL HISTORY.